# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | SANTOS MORENO, JAVIER |
| **Referencia:** | RYC2023-043017-I |
| **Correo Electrónico:** | santosmoreno.j@gmail.com |
| **Título:** | Synthetic biologist with focus on gene circuits to program cell behaviour |

## Resumen de la Memoria:

I hold and MSc in Biotechnology (U. Salamanca) and an MSc in Laboratory of Clinical Analyses (U. Pompeu Fabra). I did my PhD in Paris (U. Sorbonne Paris Cité) in less than 3 years (2016, aged 26) working on protein secretion. I studied the molecular mechanism of a bacterial (K. oxytoca) type II secretion system (T2SS), for which I described novel protein interactions and produced important results that led me to propose a new model of T2SS secretion.

During my postdoc in Lausanne (CH) I switched my focus from studying existing biological systems to building new ones. Working with E. coli, I pioneered the use of CRISPRi for building some of most important synthetic circuits (including patterning circuits, oscillators, or bistable switches), and I used those circuits for different applications, including evolutionary studies, infection studies on human pathogens (S. penuemoniae), or the re-programming of bacterial cell physiology.

My current research in Barcelona, first as a Marie Curie Fellow and now as a Juan de la Cierva Fellow, aims at engineering the human skin microbiome for diagnostic and therapeutic purposes. I have managed to render the most abundant skin bacterium (C. acnes) a routinely-transformable organism, I have developed the first molecular toolbox for this bacterium (including promoters, reporters, transcription factors, CRISPR tools, etc.), and I have constructed a C. acnes strain that produces and secretes a molecule with ROS-scavenging activity in cultures of human skin cells, which holds great potential as a therapeutic tool for inflammatory skin diseases.

In Sept. 2023 I was awarded an ERC Starting Grant of 2.3 M€

My future research will focus on programming time in living cells. Currently, our ability to program cellular actions over time is still highly limited. We rely on precisely-timed human intervention or on molecular oscillators that control repetitive processes, but we are still unable to program cells to autonomously execute custom actions at desired times. I now intend to make a big leap toward this goal by producing molecular timers in E. coli that compute time and perform desired actions at specified times. Timers will be highly programmable, re-usable and scalable, and I will extend temporal programmability to other organisms (including yeast and mammalian cells) using a simple yet efficient approach. Finally, I will exploit the potential of biological timers by using them for different applications, including: programmed cell death after a desired period, for biocontainment; precise control of task execution order and timing, for bioproduction; and 'sentinel' cells that record (extra)cellular events during the desired time-windows, for biosensing.

My results will unleash a myriad of new possibilities, both fundamental and applied. For instance, the deployment of engineered cells in open or inaccessible settings (e.g. a crop field or a polluted lake) could finally turn into a reality, since task execution and self-destruction would be genetically encoded to occur at pre-defined times. Further, programmed temporal instructions could circumvent the need for costly inducer signals in large-scale bioreactors, or enable developmental processes to be studied with minimal external perturbation. In sum, my group will develop the highly-needed, ground-breaking ability to measure and program time in cells.

## Resumen del Currículum Vitae:

I am an expert in synthetic biology that has applied synthetic gene circuits to engineer diverse members of the human microbiome – gut, lung, and skin bacteria. My research focuses on the development of new SynBio tools (e.g. CRISPRi circuits, cloning approaches, or genetic engineering methods), and on the use of those tools for varied applications, including the study of evolutionary phenomena, research on pathogen colonization, and therapeutics of skin diseases. My work has produced high-impact publications in prestigious journals (including Nat. Communications, Nat. Biotechnology, ACS Synth. Biol.) but also exploitable inventions (one patent application currently under evaluation, another one in preparation). I have published articles derived from international collaborations and participated in international projects and consortia (e.g. EIC Pathfinder).

I have proven my competitiveness during my whole career, both in studies and research. I completed my two Master's degrees in the top-2/top-3, and I obtained the highest grade for my PhD. I have been trained for 8 years in top-class institutions abroad (Univ. of Geneva, Pasteur Institute, Collège de France, Univ. of Lausanne) before moving to the Univ. Pompeu Fabra, and I have attracted competitive funding (both national and international) during my whole career, including a Marie Sklodowska-Curie Fellowship, a Juan de la Cierva Fellowship, a 2.3M€ ERC Starting Grant. I have presented my work in international conferences and obtained several prizes and awards, including the "Young Researcher in Basic Sciences" Award from Univ. Lausanne in 2021.

I have ample experience in leading people: I have supervised 15 people individually (technicians, interns, students, etc) as well as two iGEM teams (UNIL 2020 and UPF 2021) of >10 students each during 5-month-long projects. I have also a wide teaching experience, both national and international. I have taught in 9 courses in total, and I have engaged in teaching innovation activities and obtained funding to carry them out.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | DÍAZ COLUNGA, JUAN |
| **Referencia:** | RYC2023-045580-I |
| **Correo Electrónico:** | juan.diazcolunga@gmail.com |
| **Título:** | Predictively linking biological structure and function: from genomes to populations and communities |

**Resumen de la Memoria:**

The aim of this proposal is to establish a predictive theoretical framework for the precision engineering of microbial ecosystems. Microbial communities carry out critical functions in a variety of technologically relevant contexts, from preserving soil fertility in agricultural fields to producing biofuels in sugarcane biorefineries. The effect of a specific microbe on the function of a community arises from its complex interactions with other member species. However, the number of such interactions grows exponentially with the number of taxa, and the complex interplay between species and the environment makes these interactions difficult to characterize. This complexity has hindered the development of models that connect the functions provided by microbial communities with their taxonomic composition with species-level resolution. Our ability to engineer and optimize these microbial ecosystems therefore remains limited.

My recent research has demonstrated that the function of microbial communities can often be predicted using simple equations, which I have termed Functional Effect Equations (FEEs). FEEs mirror the patterns of global epistasis commonly observed in genetic systems. Here I propose to use a novel theoretical framework and experimental model system, both of which I have recently developed, to explore the emergence of FEEs from fine-grained species-by-species and species-by-environment ecological interactions. To achieve this, I will examine a wide range of species interactions in synthetic microbial communities, from negative (competition for resources) to positive (metabolic cross-feeding), by modulating their sign and strength through external environmental variation. I will then develop practical guidelines for the design of abiotic environments that optimize the delivery of target ecological functions by microbial ecosystems.

**Resumen del Currículum Vitae:**

My research lies at the intersection of ecology, evolutionary genetics, and systems biology. I combine quantitative theory, experiments, and computational models to understand and predict the emergence of biological function across scales – from single organisms to populations and ecological communities.

I obtained my PhD from the Spanish National Center for Biotechnology (CNB-CSIC), where I developed models of signaling pathway dynamics to understand and predict single-cell level phenotypes. I later became interested in the population and community scales, spending six months in the Ecological and Evolutionary Systems Biology lab at MIT. I then served as a postdoctoral researcher at Universidad Autónoma de Madrid and Yale University. During this time, I developed strategies for linking the structure of ecological communities to their functions. My work establishes connections between the genetic and ecological layers, showing that community-level functions can be predicted and optimized using tools from the field of evolutionary genetics. My research has provided practical guidelines for the design of multi-species communities, with applications in health, bioremediation, or multiple industrial processes.

I have published as first or corresponding author in several high-impact journals, including Nature Communications, Cell Systems, or PNAS. I have attended several international conferences and seminar series, both with invited and contributed presentations. I have supervised students at all stages, from the undergraduate to the PhD levels. I have also served as a reviewer for several prestigious journals, and currently maintain collaborations both within academia and with industry. These contributions, together with my quantitative background combining theory and experiments, position me as an emergent leader in the field of systems ecology.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | SERNA GIL, MARINA |
| **Referencia:** | RYC2023-045714-I |
| **Correo Electrónico:** | marinasernagil@gmail.com |
| **Título:** | Study of macromolecular complexes controlling microtubule assembly and their role in human disease |

**Resumen de la Memoria:**

I joined Prof. Valpuesta's group at the CNB-CSIC for my doctoral studies in 2007, working in a project focused on the biochemical and structural characterization of tubulin proteostasis through electron microscopy (EM). I obtained my PhD in 2013 (UAM), resulting in several publications, including a first-author research article. In 2014, I joined Dr. Bubeck's group at Imperial College (London, UK) to structurally characterize the Membrane Attack Complex (MAC), an important human immune pore, gaining instrumental expertise in cryo-EM. I was also able to solve the structure of this complex at high resolution in less than two years, yielding three publications as first author or co-author in high-impact journals (Serna et al. 2016, Nat Commun; Menny, Serna et al. 2018, Nat Commun; Morgan et al.,2016, Immunol Rev). After returning to Spain in 2016, I was awarded with a competitive Juan de la Cierva Incoporacion fellowship, joining Dr. Llorca's group at the CIB-CSIC and later at the CNIO, where I became a Research Scientist. During my tenure in Dr. Llorca's group, I have devoted myself to the study of macromolecular complexes assembly processes, focused on the g-tubulin ring complex (gTuRC), resulting in several publications as first author in prestigious journals (Zimmermann*, Serna* et al. 2020, NAR; Serna et al. 2022, Science Adv; and particularly Brito*, Serna* et al., 2024. Science; *co-first authors), as well as a co-author in several more (Lopez-Perrote et al., 2020, eLife,; Gallisá-Suñé et al., 2023, Nature Commun; Lopez-Perrote et al., 2023 chapter).

The line of research that I want to pursue through the Ramon y Cajal Fellowship hopes to build on my previous work, using cryo-EM as the primary tool. I plan to explore innovative applications of the generated gTuRC knowledge to better understand and defeat human genetic disorders. The precise functions of individual gTuRC components remains poorly characterized, partly due to limited structural details in certain regions of the complex. In the short-term, I aim to enhance these gTuRC structural features by the use of new structure stabilizing elements such as engineered gTuRC protein components and specific chemical crosslinkers. Furthermore, mutations in individual gTuRC subunits are associated with human neurodevelopmental diseases such as lissencephaly and microcephaly and eye developmental anomalies. My second aim is to analyze the effect of this mutations in the gTuRC structure taking advantage of our recently established in vitro reconstitution system. Last but not least, the gTuRC emerges as a promising anticancer target. Most common chemotherapy agents that directly target microtubules (MT) disrupt their dynamic behavior during mitotic spindle assembly, but also affect stable structures such as the neuronal axons, leading to chemotherapy-induced peripheral neuropathy, which affects up to 40% of cancer survivors. New chemotherapy agents targeting gTuRCs, could instead disrupt new MT formation without affecting pre-existing MT networks and, consequently, axonal transport. The intended approach involves the virtual screening of public compound libraries and curating a candidate list of compounds and designed synthetic peptides for subsequent testing in our in vitro yTuRC reconstitution system, as well as the structural characterization of gTURC-compound interactions.

**Resumen del Currículum Vitae:**

As a PhD student I joined the group of Prof. J.M. Valpuesta (CNB-CSIC) in 2007, being awarded with a competitive predoctoral contract from the Comunidad Autónoma de Madrid. My thesis explored the mechanism of tubulin proteostasis by structural and biochemical methods. The contribution of this work was recognized by its publication in a prestigious scientific journal (Serna et al. 2015, Journal of Cell Science). This paper was highlighted by the editors and selected by the Spanish Biophysical Society as the paper of the month. During my thesis, I was part of a multidisciplinary consortium-based project (CONSOLIDER 3D), having the opportunity to meet and closely work with world leading scientists in the field of centrosomal proteins, gaining valuable experience in both research and networking skills and participating in a number of co-authored research articles.

After obtaining my PhD degree, in 2013, I joined the newly stablished group of Dr. D. Bubeck at Imperial College London (London, UK), being awarded with a CRUK Research Associate contract. During this time, I was devoted to structurally characterize a large membrane protein complex called the Membrane Attack Complex (MAC), an important effector of the Complement Pathway of the immune system. Using state-of-the-art cryo-electron microscopy (cryo-EM) and single-particle analysis, we solved the first ever structure of the complete MAC at sub-nanometer resolution, rectifying the paradigm of MAC function prevalent at the time. This work was published in a high-impact factor journal (Serna, et al. 2016, Nature Communications) and was awarded with national and international prizes. The particularly challenge sample allowed me to established an instrumental collaborative network with cryo-EM world-class researchers including 2017 Nobel Prize Dr. R. Henderson (LMB, Cambridge, UK), and became a regular user for a number of national and international X-ray and cryo-EM facilities, and ultimately allowing me to become an expert in cryo-EM. Besides providing key insights into the MAC function and inhibition, this work became the main research line in Bubeck's group, continued with new co-authored publications (Meny, Serna et al., 2018, Nature Communications).

In 2017, following my first maternity leave, I was awarded with a competitive Juan de la Cierva Incoporación fellowship, joining Dr. O Llorca's group at the CIB-CSIC. Later that year, the group moved to the CNIO, where I obtained a permanent position as a Research Scientist. During my tenure in Dr. Llorca's group, and thanks to my expertise on cryo-EM, biochemistry and molecular biology, I have devoted myself to the study of the assembly processes of macromolecular complexes. The significance of these research findings has been acknowledged through their publication as first author in high-impact journals (Zimmermann*, Serna* et al. 2020, Science Advances; Serna et al. 2022, NAR; Brito*, Serna* et al., 2024. Science; *co-first authors), and as a co-author (Lopez-Perrote et al., 2020, eLife; Gallisá-Suñé et al., 2023, Nature Communications). As a recognition, I have received the Structural Biology Jose Tormo Prize from the Biochemistry and Molecular Biology Spanish Society (SEBBM) in 2022. Additionally, during this period I officially have trained and supervised two master students and a PhD student who will defend her thesis in March 2024.

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**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Biociencias y biotecnología
**Nombre:** MAFESSONI , FABRIZIO
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**Correo Electrónico:** fabrizio.mafessoni@weizmann.ac.il
**Título:** Reconstructing lost plant biodiversity using ancient DNA

**Resumen de la Memoria:**

I obtained my bachelor and master in biodiversity and evolution at the University of Pisa and Scuola Normale Superiore (ranked first in Italy according to ARWU) with full marks.

I then completed my PhD in October 2015, focusing on theoretical models of evolution (Mafessoni & Lachmann, 2015, Genetics), under the supervision of Prof. Michael Lachmann and Prof. Dr. Svante Pääbo (2022 Nobel Prize for Physiology and Medicine), at the Department of Evolutionary Genetics of the Max Planck for Evolutionary Anthropology (Leipzig, Germany).

During my postdoc in the same department, from 2015 to 2020, I worked mostly on ancient archaic human genomes. During this time, I reconstructed the evolutionary history of several ancient genomes, with a major focus on Neanderthal demographic history (Mafessoni & Prüfer, PNAS, 2017; Prüfer et al., Science, 2017; Hajdinjak et al., Nature, 2018; Bokelmann et al., PNAS, 2019, Peyregne et al., Science Advances, 2020) and their interactions with other human populations (Slon*, Mafessoni*, Vernot* et al., Nature, 2018; Skov et al., Nature, 2020; Hajdinjak et al., Nature 2021). Notably, I led the analyses of the third high-coverage Neanderthal genome (Mafessoni et al., PNAS, 2020). I also participated and developed methods for seminal works investigating ancient sediments (Slon et al., Science, 2017; Vernot et al., Science, 2021), and studies leveraging large genomic datasets of present-day humans to characterize Neanderthal introgression into modern humans (Skov et al.,2020, Nature, 2020). Some of these works are highly cited and have been covered by major news outlet around the world. For instance, the analysis/reconstruction of a ~90.000 year-old genome of the daughter of a Neanderthal mother and a Denisovan father (Slon*, Mafessoni*, Vernot* et al., Nature, 2018) appears on the cover of Nature, in major newspapers across the world, popular science books (Higham T, The World Before Us), and was runner-up as Science's 2018 Breakthrough of the Year.

During this postdoc I acquired strong expertise in ancient DNA, bioinformatics (Mafessoni et al., Genome Biology and Evolution, 2018), and evolutionary modeling (Mafessoni & Lachmann, Scientific Reports, 2019; Mafessoni et al., JTB, 2021).

In October 2020, I won a Senior Postdoctoral Fellowship at the Weizmann Institute of Science to study the evolution of domestication. Here, I joined Prof. Avraham Levy's group, in the Department of Plant and Environmental Sciences, where I applied my expertise on population genomic and genetic introgression to plant genomes (Dahan-Meir et al., 2023, biorxiv, Li et al., Molecular Plant, 2022), studying wild wheat populations and reconstructing the complex history of admixture and domestication of wheat. I also acquired knowledge in DNA editing in plants, studying its effect and the dynamics of CRISPR/Cas9 (Samach*, Mafessoni*, Gross*, Plant Cell, 2023, Ben Tov*, Mafessoni*, et al., biorxiv, 2023).

I produced high-impact research, with a total Impact factor: 541.712 and 1,814 Scopus citations. I am also involved in Science Outreach, through writing popular science articles and public lectures (e.g. TedX 2022).

**Resumen del Currículum Vitae:**

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | DOMÍNGUEZ ACEMEL, RAFAEL |
| **Referencia:** | RYC2023-045620-I |
| **Correo Electrónico:** | rdacemel@gmail.com |
| **Título:** | The evolution of gene regulation and 3D chromatin folding |

**Resumen de la Memoria:**

I aim to understand how genetic variation in the non-coding fraction of the genome influences gene expression and in turn leads to changes in developmental processes. This interest appeared while I pursued my PhD in the lab of José Luis Gómez Skarmeta and at the time focused on studying the 3D folding of the genome. Then (2014) it was discovered that animal genomes were organized in neighborhoods called Topologically Associated Domains (TADs). Most enhancer-promoter interactions occur within TADs, which emerged as a new regulatory layer. We hypothesized that changes in TADs could cause changes in gene expression meaningful from an evolutionary perspective. Indeed, we revealed that the organization of the vertebrate Hox clusters in two TADs, needed for the regulation of these genes in the limb, is a novelty of this clade in one of the earliest studies considering TADs as evolutionary entities (Acemel et al. 2016, Nat. Gen.). In 2017, willing to study 3D folding genome wide, I visited the lab of Job Dekker in the US to learn how to perform Hi-C. There I applied those experiments to the pectoral fins of skates.

After my PhD I moved to Germany and in 2020 I joined the lab of Dario Lupiáñez where I continued exploring genome folding and its role in evolution. Indeed, in 2022 we published a study in which we dissected the role of the CTCF binding sites (CBSs) forming the TAD boundary between the Epha4 and the Pax3 TADs (Anania*, Acemel* et. al 2022, Nat. Gen.). In 2023 we completed another study in which we describe how changes in TAD structures in skates were needed for the evolution of their spectacular wing-like pectoral fins, continuing my early works of 2017 (Marlétaz*, de la Calle-Mustienes*, Acemel* et al. 2023, Nature). In this period I also conceived a project that explores the evolution of sex-determination gene regulatory networks (GRNs) in vertebrates, a project awarded an EMBO Long Term Fellowship. To this end we combined single-cell omics and Hi-C to reconstruct the GRN of sex determination in species in which sex is determined genetically (mouse, chicken) or based on environmental cues (turtles).

As an independent researcher I plan to continue exploring the interphase between genotype and environment using sex reversal in teleost fishes as a model. In medaka (O.Latipes), sex is determined via an XY chromosome system, but sex-reversal events are common in response to environmental challenges like temperature, starvation or the presence of estrogens. In aim 1 I hypothesize that extensive epigenetic remodeling is needed to revert an initiated sex differentiation process. I will characterize this using single-cell omics, Hi-C and methylation profiling in medaka fish undergoing sex reversal. In aim 2 I will characterize the sex-reversal process in two additional medaka species (O. dancena and O. sarasinorum) that use different sets of sexual chromosomes and sex determining genes. I will interrogate whether conserved genetic programs lead to sex-reversal despite divergent sex determination mechanisms. Finally, in aim 3 I will address how different strains of O. latipes display different prevalence of sex reversal in response to temperature taking advantage of the previously generated datasets and the wealth of population genomic data available for this group. I will focus on understudied structural variants altering TADs.

**Resumen del Currículum Vitae:**

I obtained my bachelor in Biotechnology in 2013 in the University Pablo de Olavide. Already as an undergrad I developed and tested a computational model describing the growth of bacterial biofilms (Acemel et. al. 2018, Sci. Rep; PMID: 29593289). During my Master's I did an internship with José Luis Gómez Skarmeta (CABD-CSIC) and my scientific goals shifted to the interpretation of the non-coding genome. I obtained a FPU fellowship to pursue a PhD in his lab where we investigated the influence of the 3D organisation of the genome in the evolution of vertebrates. We pioneered the idea that changes in TADs were drivers for the evolution of gene regulation. Specifically, we revealed that the organization of the vertebrate Hox cluster in two TADs, needed for the regulation of these genes in the limb, is a novelty of this clade. We established that only the anterior TAD of vertebrates was connected to the regulation of the Hox genes in the ancestor of chordates (Acemel et al. 2016, Nat. Gen.; PMID:26829752) in one of the earliest studies considering TADs as evolutionary entities. To transition to genome-wide analyses, in 2017 I visited the lab of Job Dekker where I learned how to perform and analyse Hi-C experiments. There I performed Hi-C in the pectoral fins of skates, experiments that seeded a long-standing collaboration. My PhD yielded 4 first author publications (incl. Nat. Genet, Mol. Biol. Evol.; PMID:32421818), 2 reviews on TAD evolution, 1 news and views and 14 publications as coauthor. Then I decided to explore how single-cell technologies could contribute to studying the evolution of gene regulation. Thus, I joined the lab of David Garfield (Humboldt Universität, Berlin) for a brief period where I learned to analyse single-cell datasets. In 2020 I joined the lab of Darío Lupiáñez (BIMSB-MDC, Berlin). Under his supervision I conceived a project to explore the evolution of sex-determination gene regulatory networks (GRNs) in vertebrates, funded by an EMBO Long Term Fellowship. To this end we combined single-cell omics and Hi-C to reconstruct the GRN of sex determination in species where sex is determined genetically (mouse, chicken) or based on environmental cues (turtles). During my postdoc I also published 2 first author papers and 1 review. One of them explored the mechanisms of cooperation of CTCF binding sites to generate TAD boundaries (Anania*, Acemel* et. al 2022, Nat. Genet.; PMID:35817979) and the second is the completion of the skate genome and 3D epigenome project showcasing that the evolution of TADs participated in generating the wing-like morphology of the pectoral fins of skates (Marlétaz*, de la Calle Mustienes*, Acemel*, et al. 2023, Nature; PMID:37046085). Apart from the publications (26 papers in total, 10 as first author) I made 11 contributions to international congresses including 7 talks. I also engage in peer review (i.e Nat. Genet., Elife, Sci. Adv.), participated in 2 PhD evaluation committees and co-supervised both undergraduate and PhD students. Besides, I have been teaching R programming in the Pablo de Olavide university and participate in science dissemination activities. Recently, I relocated to Spain to develop an independent research line. I aim to investigate how genetic and epigenetic variation across and within a species influence gonad plasticity in teleost fishes.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | ROSSETTO MARCELINO, VANESSA |
| **Referencia:** | RYC2023-042907-I |
| **Correo Electrónico:** | vrmarcelino@gmail.com |
| **Título:** | Microbiomes – diversity, ecology and applications |

**Resumen de la Memoria:**

It is now clear that microbial communities play an important role in the health, fitness and productivity of the host they live in, but we do not fully understand how. We have only rough estimates of which microbial species exist and where to find them, and we have very little knowledge about what these species are doing in those communities and how they interact. Understanding such complex systems is a challenge in both microbiology and data science fields, and that is where I made most of my contributions. My work has focused on creating and applying new molecular and bioinformatic approaches to better understand host-associated microbiomes.

I obtained a PhD from the University of Melbourne (Australia) in 2017, making significant contributions to our understanding of the diversity and evolution of microbes associated with coral reefs. I pioneered the simultaneous assessment of microbial eukaryotes and prokaryotes by designing a cost-efficient multi-marker metabarcoding protocol, a bioinformatics pipeline and a curated reference database (Scientific Reports 2016). Although the focus of my PhD was coral reefs, the protocol I developed has been internationally adopted by marine microbiologists and our initial work has attracted over 100 citations. It formed the basis for the rest of my PhD work (another 4 papers), and allowed the discovery of an uncharted fungal and microalgal biodiversity with key roles for coral health and resilience.

As a postdoc, first at the University of Sydney and then at the Hudson Institute (Monash University), I turned my focus towards medically relevant microbes. Among others, I developed CCMetagen – an open-source software for accurate identification of microorganisms using metagenome data (Genome Biology 2020). This software has been widely used in academia and industry (>55k downloads tracked with PePy, >100 citations), proving to be particularly useful for the detection of pathogens in humans and in the food supply chain.

In 2023 I established myself as a group leader at the University of Melbourne. My research program is supported by over $3.3M AUD (ca. 2M EUR) in competitive funding, including $951,135 AUD (ca. 570k EUR) that I have earned as principal investigator. My most recent work focuses on identifying the ecological attributes of microbiomes that can be used to manipulate them effectively. I developed a new method to help identify which metabolic interactions are important to create a healthy gut microbiome (Nature Communications 2023). Among many new findings, our approach revealed first-time evidence that a lack of bacteria with the ability to consume hydrogen sulphide is linked to Crohn's Disease, not an increase in bacteria producing it as was previously believed.

My vision is to help identify ecology-grounded strategies of microbiome engineering. I use the human gut microbiome as a model system, but the methods and knowledge generated in my research program are widely applicable in other host-associated and environmental microbiomes. Building upon my expertise in basic and applied microbiome research, ecology and computational biology, my Ramón y Cajal project will establish new bioinformatics and experimental approaches to understand nutritional interactions in complex microbial communities, paving the way to design new strategies of modulating microbiomes for better gut health.

**Resumen del Currículum Vitae:**

INTERNATIONALIZATION AND MOBILITY:
I have 13 years of experience at top-ranked international institutions since obtaining my bachelor degree in Brazil, including:
2010 – 2012: Joint Erasmus Mundus MSc at Universities of Bremen (Germany), Pierre et Marie Curie (France) and University of Ghent (Belgium)
2013 – 2017: PhD at the University of Melbourne (Australia)
2017 – 2020: Research Fellow at the University of Sydney (Australia)
2020 – 2023: Research Scientist at Monash University (Australia)
2023 – Present: Group Leader at the University of Melbourne (considered the best university in Australia by THE and QS rankings).

SCIENTIFIC OUTPUTS:
I have 37 peer-reviewed publications. These include 14 publications as first and corresponding author, and an additional 10 as either first or second author. My work has attracted over 1100 citations (Google Scholar), and my h-index is 21. My citation record shows a clear upward trajectory with 330 citations in 2023. The majority of my papers (81%) were published in Q1 journals, including in high-impact journals such as Nature Communications, Nature Methods, Current Biology, ISME J, Microbiome, Molecular Ecology, and Cell Reports Medicine, demonstrating my ability to produce high-quality scientific outputs.

INDEPENDENCE AND LEADERSHIP:
I run my own lab since February 2023. I have attracted over 500k EUR in competitive funding as sole and lead investigator. I have trained research assistants in wet and dry lab procedures (2x), supervised students (5x), and have recently hired a postdoctoral fellow to join my team. My students have won awards at national and international conferences (4x).

OPEN SCIENCE:
I strive to create open-source and user-friendly tools to facilitate microbiome data analysis and interpretation. For example, my CCMetagen software is available as a free web service, and I wrote a step-by-step tutorial on how to use it. I have contributed to hands-on workshops in data analysis in

Brazil and Australia. I also guide my students in delivering user-friendly software and tutorials for microbiome research (Bioinformatics 2022; GigaScience 2023).

ENGAGEMENT:
1)      ACADEMIC COMMUNITY: I have served as a grant accessor for major Australian funding bodies (6x), graded Honours and Masters theses (4x), and reviewed manuscripts for over 20 scientific journals. I co-organised one Australasian and two national conferences. I have contributed to teaching at both undergraduate and MSc levels.
2)      PUBLIC: I have given interviews for a range of science communication channels, including podcasts and magazines (e.g. New Scientist). I have contributed to science outreach programs for high-school students.
3)      INDUSTRY AND END-USERS: I have engaged with industry (2x), practicing clinicians (3x), government bodies (2x) and a team of the World Health Organisation to assist with assessments of potential pathogens and antimicrobial resistance within microbiomes.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | RUIZ ORERA, JORGE |
| **Referencia:** | RYC2023-044454-I |
| **Correo Electrónico:** | jorge_ruiz_orera@hotmail.com |
| **Título:** | Evolution, annotation, and characterization of open reading frames |

**Resumen de la Memoria:**

While conserved protein-coding genes only comprise 1-2% of the human genome, one of the keys to human complexity lies in the overlooked molecular roles of the remaining 99% of our DNA. My research has been centered on understanding the evolutionary and functional significance of these non-coding regions of the human genome:

Research Line 1: The Role of Long Non-Coding RNAs in De Novo Gene Evolution. The behavior and physiology differences among closely related species are intricately linked to variations in their gene content. While gene duplication and subsequent sequence divergence have been the recognized mechanisms for gene birth, the emergence of genetic novelty through de novo gene evolution has been a longstanding mystery in evolutionary biology. During doctoral training under Prof. Dr. Mar Albà, I pioneered computational approaches to investigate this mode of gene evolution. Utilizing large-scale transcriptomics data, I identified hundreds of new human- and primate-specific expressed long non-coding RNA genes, challenging the belief that human de novo evolved genes are rare. This work highlighted the significant role of de novo gene evolution in shaping functional innovations in mammals, with recent evidence confirming its widespread occurrence in evolution.

Research Line 2: Evolution, Annotation, and Characterization of Non-Canonical Open Reading Frames. Building on the understanding that many long non-coding RNAs (lncRNAs) are recent in evolution and associated with ribosomes, I explored the role of non-canonical open reading frames (ORFs). Analyzing public ribosome profiling datasets across diverse rodent tissues, I established computational methods to assess the conservation and coding potential of translated ORFs. I identified hundreds of "non-canonical" translations in rodents, lacking evolutionary conservation or selective constraints. Some recently evolved ORFs were found to be under selection, indicating recent functional acquisition. Postdoctorally, I led projects developing computational approaches for developing and analyzing ribosome profiling datasets in various human settings, including datasets with clinical relevance for cancer. I currently co-lead an international consortium effort to create a consolidated annotation catalog of human ORFs, and I mainly contributed an open-source computational method for their first genome-wide identification in a pilot project.

Research Line 3: The Translational and Single-Nucleus Transcriptomic Landscape of Cardiac Disease. During my postdoctoral training, I developed computational approaches in extensive collections of sequenced mammalian cardiac translatomes. In the first collection involving a well-characterized rat model system, I found a genetic translation machinery defect which led to a heart-specific reduction in overall protein synthesis, particularly in microproteins. In the second collection of 80 human left ventricle transcriptomes, I assisted a PhD student to identify 27 RNA-binding proteins associated with cardiac translational regulation in vivo. More recently, I collaborated in generating and analyzing the largest cell atlas of cardiac disease, utilizing single-nucleus RNA sequencing to characterize the transcriptome of non-ischemic adult human hearts with pathogenic variants in Dilated Cardiomyopathy (DCM) genes or idiopathic disease.

**Resumen del Currículum Vitae:**

I am a Computational biologist with an academic background in Biotechnology and Bioinformatics. I completed my Ph.D. dissertation in Biomedicine with Prof. Dr. Mar Albà (GRIB, Barcelona) in 2017. As a predoctoral trainee, I pioneered the study of de novo genes and translated long non-coding RNAs, and my work resulted in the publication of three first-author, high-impact articles. My Ph.D. was funded by the Science Ministry and was awarded the Doctoral School Special Prize of the Ph.D. Programme in Biomedicine and the International Mention for a short-term research stay hosted by Prof. Dr. Diethard Tautz at the MPI for Evolutionary Biology (Plön, Germany) in 2015.

I am currently a Postdoctoral Researcher at the Max Delbruck Center in Berlin (Germany), supervised by Prof. Dr. Norbert Hübner, a referent researcher in the field of Cardiovascular Disease. My research track has provided me with an excellent background in multiple unique state-of-the-art computational disciplines. For example, I have developed computational methods for the analysis of large-scale multi-omics data. I have also established a method for the genome-wide identification of novel non-canonical human translations and microproteins, generating the first set of non-canonical translated sequences supported by GENCODE. My track record consists of 27 scientific articles. My independent and committed involvement in these projects is emphasized by eleven first author (six unique and five shared), five second author, and two co-correspondence author contributions.

As a proponent of open science, I have actively promoted public open access and ensured research reproducibility by making all computational tools available in open repositories. Through participation in a one-year career development program at my current institute (ASPIRE), I have enhanced my academic leadership skills and gained additional qualifications. I have mentored three Ph.D. candidates and formally supervised the work of two master students.

I regularly build upon my scientific knowledge through workshops and conferences. I am currently a member of The Society for Molecular Biology and Evolution and the Spanish Society of Bioinformatics and Computational Biology. I support community building, and I have developed my own independent networks in evolutionary biology, bioinformatics, and reference annotation communities. I am currently involved in joint projects with several national and international researchers. I have independently initiated and co-founded an international consortium to create a unified catalog of microproteins and non-canonical translations (Mudge et al. 2022, I am co-first and co-corresponding author). This consortium is currently supported by the main reference annotation databases and includes several world-recognized researchers in the fields of genomics, proteomics, and database

annotation. This ambitious consortium pursues the long-term objective of characterizing the hidden proteome, a task that will require strong multidisciplinary skills, which I have collected during my academic track.

I have always been very motivated to pursue an independent research career in higher education or other Spanish scientific institutions. I am confident the RyC Track will be a key milestone to achieve this goal.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | CARRERAS SUREDA, AMADO |
| **Referencia:** | RYC2023-042782-I |
| **Correo Electrónico:** | amado.carrerassureda@unige.ch |
| **Título:** | Targeting ER membrane contact sites to prevent T cell aging |

**Resumen de la Memoria:**

My trajectory as a scientist has always been devoted to the study of the endoplasmic reticulum function from an ion channel, proteostatic and bioenergetic prism which can be divided three main periods.

First, during my master and Ph.D. studies at the University Pompeu Fabra where I was trained to study how ion channels on the plasma membrane were modulated by the endoplasmic reticulum (ER) and the mitochondria to shape immune T cell biology.

My second period as a postdoctoral fellow came from a decision to expand my knowledge on ER-stress and the unfolded protein response, both processes critical for a proper ER homeostasis. There I brought my knowhow in Ion channels to study how the ER-stress machinery could communicate with the mitochondria.

The third and current period as junior Lecturer at Unige has allowed me to start my own projects regarding ER stress and ion channels in the context of T cell activation and aging, muscular diseases and amyotrophic lateral sclerosis. In turn I developed a new method to study ion channel function using functional genomics.
My proposed project as a Ramon y Cajal fellow will aim to explore how ER-mitochondria signalling is regulated during T cell aging and activation. To do this I will use my knowhow on ER-mitochondria contact sites, bioenergetics, proteostasis and T cell physiology.

Project proposal summary:
Lymphocytes are key players of the adaptive immune system that fight pathogen infections, prevent cancer development and promote tissue repair. Recent planetary challenges have demonstrated that adaptive immunity mechanisms are the most robust line of defense to prevent and clear infections. Unfortunately, we have also witnessed that this system loses effectivity with age due to intrinsic cellular processes that compromise, among others, protein homeostasis (proteostasis) and mitochondrial functions. Of note, these two processes are regulated in a subcellular signalling hub located in the contact site between the endoplasmic reticulum (ER) and the mitochondria, named ' mitochondria-associated ER membranes' (MAMs). MAMs are implicated in the transfer of ions, lipids and metabolites between the two organelles, regulating cellular homeostasis, bioenergetics, and cell death. Calcium signalling at MAMs is mediated by the ER channel inositol trisphosphate receptors (IP3R) and Voltage gated anion channels (VDAC) in the mitochondria to sustain OXPHOS or to induce cell death if this transfer is excessive. Several components of the innate immunity machinery are present at MAMs while adaptive immune cells like T cells rely on this axis for effective activation and to sustain the metabolic rewiring after pathogen-mediated cellular stimulation. MAMs have been studied during aging in different cellular systems like muscle, liver or neurons, however little is known about this interphase in the immune system and even less during Aging. Our preliminary data, where we explored MAMs formation during T cell activation and MAMs composition in aged CD4 T cells clearly reveals that this interphase is regulated during TCR stimulation and that aged CD4 T cells have reduced IP3R1/VDAC1. Due to the relevance of MAMs for proteostasis and bioenergetics, together with our preliminary observations, we propose to study and target the MAMs interphase to improve T cell function during aging.

**Resumen del Currículum Vitae:**

I am a fundamental cell biologist and cellular immunologist with a deep interest on how cells can adapt to stressful situations. I focus on the physiological and pathological processes related to ER plasma membrane (PM) and ER-mitochondria (MAMs) ion transfer and its impact on bioenergetics and proteostasis. I use immune cells as experimental models, where ion channels and metabolism play a critical role during aging and activation. These same pathways are common in different diseases and I have recently focused on neuromuscular diseases like ALS where ion channels and ER communication with other organelles are altered.

Ph.D. student; University Pompeu Fabra (Barcelona, Spain). Areas of research: T cell activation ER to PM and mitochondria signaling, autophagy, mitochondrial calcium uptake, lipid signaling and ER-stress. Murine T cell isolation and differentiation (lab. of Prof. Stephan Feske (New York, USA). Output: 3 first author papers (Carreras-Sureda A. et al. Hum. Mol. Genet. 2013. Carreras-Sureda A. et al. JBC. 2015 and Carreras-Sureda A. et al. Plos one. 2016). 3 co-authorship papers. Dissemination: Poster presentations: 5 first author, 3 national, 2 international and the PRBB open day. Awards/mentions/Grants: Best poster in the Third Spanish Meeting of Ionic Channels. Best Ph.D. thesis finalist

Postdoctoral Studies: Biomedical Neuroscience Institute (U-Chile, Santiago de Chile, Chile). Areas of research: ER-stress, proteostasis, bioenergetics, neurodegenerative diseases, diabetes, animal models. Biochemical and functional studies of ER-mitochondria sites (laboratories of Geert Bultnyck and Patrizia Agostinis, University of Leuven, Belgium, Embo short term Fellowship). Output: 1 fist author paper (Carreras-sureda, et al Nat. cell. Bio. 2019) with Cover, 2 editorial comments, 3 first author reviews and co-authored 5 publications. Dissemination: 2 first author posters in international conferences and national press coverage of main research output). Awards/mentions/Grants: FONDECYT post-doctorate scholarship (110.000 $). Teaching/Supervision: Molecular and cellular medicine, Faculty of Medicine, University of Chile (2015-2016, 24h). Supervision/mentoring of 3 Ph.D. students.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Junior Lecturer (50% independence): University of Geneva (UNIGE, Geneva, Switzerland). Areas of Research: ER-stress, ion channels, functional genomics, bioreporters, T cells, ER contacts to plasma membrane and mitochondria, motoneuronal and muscular diseases. Output: 1 first author work (Carreras-Sureda A. et al, Elife, 2021) 1 first, co-last and corresponding (Carreras-Sureda A. et al, Cell Rep, 2023). Co-authored 7 papers (2 under review) and 2 under preparation. Dissemination: Organizer and chair the PI of tomorrow session of the life sciences Switzerland (LS2) congress 2022. 1 invited speaker (ECS Workshop), 1 talk (FASEB meeting), 1 talk (LS2), 4 first author posters at national and international meetings. Awards/mentions/Grants: R3 certificate (CR32023-039338), SPARK (100.000 CHF); Novartis Young investigator grant (80.000 CHF); Sir Jules Thorn Foundation award (150.000 CHF), Foundation Swisse Recherche Maladie Muscularie. (142.000 CHF). Teaching/Supervising: 3 post-doctoral researchers (one now research associate in Korea), 4 Ph.D. (2 of which I co-direct) and 1 master Student. Teaching in two master courses at UNIGE (Biomedical sciences, 54h).

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | FRANKE , MARTIN |
| **Referencia:** | RYC2023-043037-I |
| **Correo Electrónico:** | mfra2@upo.es |
| **Título:** | Mapping and sensing the cis-regulatory architecture in vivo |

**Resumen de la Memoria:**

I developed my career at the crosstalk of basic Biology fields: Genetics, Molecular Biology, and Developmental Biology. I have investigated how the non-coding genome, in particular enhancers, and chromatin architecture that bridges enhancers with their target genes regulate gene expression. By integrating cutting-edge technologies, I have explored how changes in chromatin architecture contribute to gene regulation in development and disease. Initially, I focused on specific gene loci using mouse models in my PhD, then transitioned to genome-wide approaches using zebrafish during my postdoc. Recognizing the advantages of diverse animal models, I established and characterized new genetic models in zebrafish. Currently, I am investigating how chromatin architecture influences cell-type-specific gene regulation throughout embryonic development.

Through my diverse research experiences at renowned institutions in Germany and Spain, including the Leibniz Institute (Jena), Max Planck Institute (Berlin), EMBL (Heidelberg), and CABD (Seville), along with international collaborations, I have grown an extensive scientific network. This exposure has equipped me with interdisciplinary approaches, which I aim to further enhance and integrate in Spain as I establish myself as a group leader. In my proposed research program, I leverage my experience to develop innovative approaches aimed at addressing controversial questions in the field of gene regulation, employing zebrafish as a model. I will elucidate the role of chromatin architecture in establishing cell-type specific enhancer-gene interactions genome-wide and during cell differentiation, offering new insights for cell reprogramming strategies. Finally, I address a major bottleneck in the field of Functional Genomics: testing regulatory activity at genomic scale that has the potential to functionally connect chromatin architecture and enhancers function in vivo.

The significance of my work is reflected in high-impact publications where I have contributed as co-author (Cell, 2x Nat. Genet., Cell Rep., PNAS, Nat. Commun., 2x AJHG), as well as in my first-author publication of my PhD in Nature, and two recent first-author publications during my postdoc in Nat. Commun and AJHG. Furthermore, my research not only advances knowledge in gene regulation but also in Human Genetics. It was recognized with a talk at the Plenary session of the European Human Genetics Conference in 2016 (Barcelona, Spain) and an invitation to lecture at the 20th Congress of the European NeuroEndocrine Association in 2022 (Lyon, France).

Throughout my career, I gained expertise in state-of-the-art technologies (RNA-seq, ATAC-, ChIP-, 4C-seq, HiC, single-cell RNA-seq) and expanded my bioinformatic skills for data analysis. Additionally, I've always been committed to transferring my knowledge to young researchers and collaborators. Since my postdoc, I have secured funding through competitive European (Marie Sklodowska-Curie fellowship) and Spanish calls (Juan de la Cierva - fellowship). Lastly, I have been able to raise independent project funding through the LaCaixa Junior Leader Program, which allowed me to assemble a small research team at the CABD. This financial support has enabled me to formulate questions, gather data, and shape the research trajectory that led me to the here-proposed RyC project.

**Resumen del Currículum Vitae:**

My goal is to understand gene regulation during development and its disease implications. In my PhD at the MPI for Molecular Genetics (Berlin) under Prof. Mundlos, I studied how non-coding mutations influence gene expression and limb development. By establishing and applying state-of-the-art technologies, like Chromosome-Conformation-Capture provided insight into how enhancers interact with their target genes to regulate gene expression patterns at the Sox9 locus. My pioneering work, published in Nature (2016; first author), introduced a novel concept: the pathogenic effect of structural variations in humans is determined by their position relative to the 3D genomic organization.

In 2018, I joined Prof. Gómez Skarmeta's lab at the CABD in Seville (Spain), as a postdoc, aiming to expand my understanding of regulatory mechanisms from specific loci to a genome-wide scale during development and evolution. I established and analysed a unique zebrafish model that allowed for the first time to assess the contribution of 3D chromatin architecture on gene expression during animal and tissue development, published in Nature Communications (2021; first-author). In parallel, I leveraged my expertise in gene regulation to unravelling the pathomechanism behind non-coding mutations in pituitary tumors, potentially explaining the tallest humans in recorded history. My intellectual and technical contribution to the deeper understanding of this rare disease was exemplified in my second first-author publication during my postdoc, published in The American Journal of Human Genetics (2022).

Throughout my career, I became skilled in mouse and zebrafish genetics, CRISPR/Cas9 genetic modifications, multiple functional genomics approaches (4C-seq, HiC, RNA-, ATAC-, and ChIP-seq,) and integrated new technologies in my research (UMI-4C and capture HiC). This ample state-of-the-art toolset allowed me to contribute to impactful publications in high-ranking journals like Cell, 2xNat. Genet., Cell Rep., PNAS, Nat. Commun. and 2xAJHG. Additionally, I disseminated my work at several international conferences in diverse research fields, including human genetics. These achievements, coupled with my research output, underscore my commitment to translating basic research findings into clinical applications.

Finally, I acquired leadership skills through managing interdisciplinary collaborations, mentoring early career researchers (co-supervision one Master and one PhD student), and acquiring competitive international and national fellowships and grants. During my postdoc, I was funded by the Marie Sklodowska-Curie fellowship and subsequently by a Juan de la Cierva fellowship. Seeking for further independence I secured funding for my research with the highly competitive LaCaixa 'Junior Leader' fellowship. As a young group leader at the CABD, I am expanding my team and research scope Our

ongoing work, utilizing cutting-edge single-cell technologies, explores how genome architecture influences cell differentiation during embryonic development. Presented at an EMBO conference in 2023, our findings shed light on controversial questions regarding the role of chromatin structure in gene regulation. I strongly believe that the RyC funding will be crucial for establishing myself as an independent group leader in Spain, providing opportunities for obtaining key competitive grants.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | GARCIA  SANTAMARINA, SARELA |
| **Referencia:** | RYC2023-045619-I |
| **Correo Electrónico:** | sarela.garcia@gmail.com |
| **Título:** | Microbial adaptations to stress |

**Resumen de la Memoria:**

I obtained my Ph.D. from Pompeu Fabra University (Barcelona), where I worked with Prof. Elena Hidalgo on redox biology. During this time, I contributed to understanding how highly reactive oxidants achieve specificity as signalling molecules, and uncovered novel pathways for responding and detoxifying oxidative stress in fission yeast. In my first postdoc at Duke University in Prof. Dennis J. Thiele's lab, I delved into how host immune cells utilize both metal deprivation and excess to defend against pathogens. I identified novel regulatory mechanisms used by the human fungal pathogen Cryptococcus neoformans to thrive in environments with varying copper concentrations, particularly within the host. I identified that copper toxicity affects iron-sulfur cluster proteins and discovered a novel pathway for copper acquisition and virulence (Nature Chemical Biology).

As a postdoctoral EIPOD3 fellow at EMBL-Heidelberg (Germany) working with Dr. Athanasios Typas, Peer Bork, and Kiran Patil, I led a project aiming to explore whether the drug-microbe interactions observed in individual cultures were replicated in complex gut microbial communities, which more accurately mimic the gut environment. I found that both cross-resistance and cross-sensitization emerge in community contexts; the nature and severity of the stress dictate whether communal behaviors emerge; and drug metabolism, drug bioaccumulation, and interspecies interactions are the dominant drivers of such emergent communal microbial traits. This work is published in bioRxiv and undergoing revision in Cell.

Currently, in my research group at the Instituto de Tecnologia Quimica e Biologica (ITQB NOVA), I am building upon my previous expertise and findings to take them to the next level. We are investigating the impact of trace elements on the composition and functions of the gut microbiota, including gut microbial metabolism, pathogen colonization resistance, and antibiotic resistance. Furthermore, we aim to understand how the gut microbiome, including its nutritional status, impact the mode-of-action of drugs that target human proteins. The focus of my research lies in the intersection of microbiome, nutrition, and medication interactions, and aims at enhancing our understanding of gut microbiome physiology and metabolism, and advancing both current and innovative therapeutic strategies.

**Resumen del Currículum Vitae:**

Since October 2021, I am a Junior Group Leader of the Human Microbiota – Xenobiotics Interactions lab in the MOSTMICRO unit at the ITQB NOVA research centre, affiliated with Nova University of Lisbon, Portugal. Before having this role, I completed a Ph.D. in Biomedicine at Universitat Pompeu Fabra in Barcelona, Spain, followed by a 4.5-year postdoctoral stay at Duke University (USA) and a subsequent 3-year postdoc position at EMBL Heidelberg. The latter was supported by a Marie-Curie co-fund, which I obtained in a competitive call.

Throughout my scientific career, I have made significant contributions to microbiology, encompassing research on the human gut microbiome, fungal pathogenesis, and microbial responses to stress. These contributions are reflected in 27 publications, with 10 of them featuring me as the first or co-first author, and one as a co-corresponding author. Published in prestigious journals such as Nature, Nature Protocols, PLoS Pathogens, and Nature Chemical Biology, my research also includes one work currently under revision at Cell. I have presented these findings at over 10 conferences as an invited speaker or through selected oral communications. Noteworthy invitations include speaking and serving as a Session Chair at the 18th International Symposium on Microbial Ecology (ISME18, 2022), and presenting at events like the Cold Spring Harbor Microbiome Meeting (2019) and the EMBO|EMBL Symposium on Human Microbiome (2023).

In my capacity as an independent group leader, I have secured substantial funding, including covering my salary for the next 6 years through the "5th Call for the Stimulus of Scientific Employment Individual Support" from Fundação de Ciência e Tecnologia (FCT), Portugal (2023-2029, 338,160 euros). I am also the Principal Investigator of an Exploratory Project (25,000 euros), funded by the FCT, and received an EMBO Innovation Grant for a scientific visit to Jena Uniklinikum in Alexander Mosig's lab (5,372 euros). I am engaging in both national and international collaborations, I am the coordinator of a Horizon-Widera-2023-Access-02 grant (currently under evaluation), involving 1 national and 3 international partners, as well as participating in Project Horizon 2020 Twining Symbnet, among others.

In terms of mentorship, I am currently supervising 1 Ph.D., 2 MSc, and one postdoctoral researcher. Additionally, I have co-supervised 2 completed MSc theses and have taken on lecturing roles in various academic settings, including MSc and Ph.D. programs. Specifically, I am co-coordinating a Ph.D. curricular unit at ITQB NOVA (1.5 ECTS).

I actively participate in science outreach activities such as SoapBoxScience, international science festivals, interviews with newspapers, Twitch channels, and radio shows. I am also involved in a citizen science project focusing on studying the human gut microbiome and its evolution. Contributing to the scientific community, I co-organize a mentoring program at ITQB for postdocs and principal investigators, serve as a jury member for Ph.D. theses, and actively review submissions for reputable journals and grant agencies.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | MIGUEL ROMERO, LAURA |
| **Referencia:** | RYC2023-045482-I |
| **Correo Electrónico:** | laumiro2@gmail.com |
| **Título:** | Study of Phage-Inducible Chromosomal Islands and their helper phages inter-relationship, key in virulence and bacterial adaptation. |

#### Resumen de la Memoria:

My scientific career has been dedicated to the study of the molecular mechanisms involved in bacterial pathogenesis and adaptation from a structural and a functional perspective due to its implications for humankind. Along these years, I have studied two different molecular mechanisms directly related with bacterial pathogenesis and antibiotic-resistant bacteria (AMR), regulation and acquisition of Two-Component Systems (TCS) and/or mobilization of the Phage Inducible Chromosomal Islands (PICI) in the bacterial genome. During my PhD I studied canonical and atypical TCS, the main signal transduction systems highly widespread in bacteria and absent in animals, which constitute a potential antimicrobial target. In the same way, during my postdoctoral stage, I worked characterizing important processes in PICI mobilization. PICI are one of the most studied family of Mobile Genetic Elements (MGE) with implication in bacterial evolution and virulence as their genomes encode toxins, virulence and also antibiotic resistant genes which can be spread between species due to their mobility at high frequencies. Therefore, the main goal during my scientific career has been to understand the mechanism of action and mobility driven by TCS and PICI as a crucial objective to fight pathogenic bacteria. Due to the great health challenge posed by the exponential increase of these bacterial species, the study and knowledge more in depth of this becomes crucial.

My current main research line will study in detail the most important process for PICI mobilization, the packaging of their genome into viral capsids. Typically, PICI hijack, in part or in whole, the packaging machinery from bacteriophages that we call helper phages. With this, PICI insert their genome into the capsid produced by the helper phage and form infective particles ready to be disseminated. The intimate interrelationship between helper phages and PICI is crucial in this process. Moreover, this mechanism is the subject of multiple interference strategies carried out by PICI against phages, which constitute the most evolved parasitism strategies in nature. All these recent findings make PICI the most evolved MGE in nature with an important influence on bacterial populations. But despite all these findings, most of the information on these processes is based on in vivo studies and little or no structural information is available on them. Structural biology is a powerful technique that helps in studying the mechanisms in detail and is extremely necessary to understand all these processes at the molecular level.

The main goal of this project is to study the interrelationship between the PICI and the helper phage during the genome packaging process. But also, the interference strategies encoded in PICI against helper phage genome packaging. The project mixes structural and biochemical approaches, but in conjunction with in vivo techniques. I would like also to extend the structural study to the genome packaging process of the phage lambda, still unknown despite being the most studied phage. I propose a project that will help to understand more in detail the MGE mobilization, key for bacterial virulence and protection. The results obtained with this project will generate hitherto unseen structural information with broad and substantial biological and biotechnological implication.

#### Resumen del Currículum Vitae:

After obtained my degree in Biochemistry by Universitat de València, I started my career with my MSc internship and my PhD in Dr. Alberto Marina's group at Instituto de Biomedicina de Valencia-CSIC (IBV), by obtaining a PhD fellowship "Formación de Personal Investigador" by the Ministerio de Economía y Competitividad in 2011. There, I work characterizing the molecular mechanism driven by canonical and atypical TCS, the main signal transduction systems in bacteria involved in adaptation and pathogenesis. In this period, I gained expertise in structural biology (crystallography, X-ray diffraction in European synchrotrons) together with biochemical and biophysical techniques. In 2014, I obtained a 3-months fellowship to conduct a stay in Dr. David Stokes' group at Skirball Institute of Biomolecular Medicine in New York University of Medicine to learn the emergent structural biology technique cryo-electron microscopy. There, I conducted studies of membrane proteins involved in TCS reconstituted in Nanodiscs. The results obtained have been shared in national and international conferences and published in Biochim. Biophys. Acta in 2012, Nature Commun. in 2014, Nanomedicine and FEBS Letters in 2015, Sci. Rep. and Nucleic Acids Res. in 2017.

After my PhD defense in 2017, I worked as a postdoctoral researcher for one year in Dr. Marina¿s group studying the TCS use as potential antimicrobial targets. I used the XChem facility at DLS synchrotron (Oxford) and I implemented in the laboratory the rational drug discovery using X-ray screening of small molecules. The results during this period has been published in Methods in Molecular Biology, Nature Commun. and PNAS during 2020.

To acquire new knowledge and broaden my research skills, I continued postdoctoral studies with Prof. José Penadés at University of Glasgow thanks to a fellowship funded by Fundación Ramón Areces. There, I implemented my structural and biochemical knowledge giving a new perspective in the group's projects. And, I acquired skills in microbiology and virology, as well as in bacterial genomic manipulation, for the study of Phage-Inducible Chromosomal Islands (PICI) in gram positive and gram negative bacteria. PICI are one of the most studied Mobile Genetic Elements family responsible for bacterial virulence and adaptation. PICI can be mobilized at high frequencies between species to convert avirulent bacterial strains into virulent.

In 2021, Prof. Penadés' group moved to Imperial College London and I joined him as a Research Associate. There, I got access to facilities in structural biology, such as cryo-EM, consolidating my knowledge and accelerating the progress of my ongoing projects. The results obtained during my postdoctoral stage were shared to interantional congresses and workshops and published in Nucleic Acid Res. in 2022, Cell Host and Microbe in 2023, and in a second article that is currently under second revision in Nat Commun. Moreover, during these years I have co-supervised PhD student Mohammed Hussein Alqasmi and MSc Grabriella Dow.

In 2022, I earned the CDEIGENT grant financed by Valencian Government to start my career as independent researcher in IBV where I joined in July 2023. The same year I gained also the "Proyecto de Generación de conocimiento" by Ministerio de Ciencia e Innovación to develop my own research lines as principal investigator.

**Resumen de la Memoria:**

Planctomycetes belonging to the PVC superphylum (Planctomycetes, Verrucomicrobia, Chlamydia), encompass diverse bacteria playing crucial roles in the main biogeochemical cycles. Planctomycetes exhibit distinctive features, they have characteristics that are rare in bacteria, some of which are more common in archaea or eukaryotes. Planctomycetes enigmatic characteristics, such as their developed endomembrane systems and division mechanisms, pose intriguing challenges, with potential links to eukaryogenesis. Despite the growing interest in their study, limited genetic tools hindered planctomycetal characterization. Computational, proteomic, and microscopy analyses have shaped our understanding of these bacteria.

At the beginning of my postdoctoral stage, I developed genetic tools to study members of the Planctomycetes. These tools have just been fine-tuned incorporating a protocol to perform random mutagenesis at large scale. This achievement has enabled me subsequent molecular studies, in particular, the analysis of planctomycetal membranes and also deciphering their division mode.

Regarding membranes, I have described for the first time the essentiality of sterols in the Planctomycete Gemmata obscuriglobus, along with the formation of aberrant membranes and defects in division, when its production is restricted. This essentiality complicates the interpretation of horizontal gene transfer as the origin of the sterol synthesis genes in this bacterium. This is not the only particularity, they also display the most developed endomembrane bacterial system, some of them having genes that code for proteins structurally related to membrane proteins involved in the formation of the eukaryotic endomembrane system (membrane coat protein). Furthermore, we have described a biosynthetic pathway for the production of C30 carotenoids with squalene as the precursor in the pink Planctomycetes Planctopirus limnophila. This pathway is the most widespread among Bacteria, representing a paradigm shift in C30 carotenoid production.

More recently, I am focused on planctomycetal cell division. The lower branching orders, "Candidatus Brocadiales" and Phycisphaerales, divide by apparently binary fission, the most frequent mode of division in bacteria, the Planctomycetales order divides by asymmetric division, similar to budding. Our previous in silico analysis of division-related genes confirmed the absence in Planctomycetes of the central omnipresent protein FtsZ. Besides, a pattern of degradation in the division and cell wall (dcw) genes is observed, which could be related to their peculiar modes of division. We provided that at least three proteins from the divisome and the elangosome, FtsI, FtsW and MreB are non-essential in P. limnophila. On the other side, the DNA pump FtsK remains essential.

The recent data obtained from tn-seq analyses uncovers the non-essentiality of functions assumed to be essential. Most of the genes related to cell division and peptidoglycan synthesis are not essential, despite Planctomycetes produce saculli. In conclusion, the canonical machinery of cell division is not essential in P. limnophila, which divides through budding with a yet-to-be-determined mechanism, representing a unique case within Bacteria. With this background, my future project aims to decipher the mechanism by which Planctomycetes divide by budding.

**Resumen del Currículum Vitae:**

I completed my Bachelor's degree in Environmental Sciences at the University Pablo de Olavide (UPO, Spain), and then pursued a Master's in Biotechnology at the same institution. My academic journey continued at UPO with a PhD, supported by a UPO PhD Fellowship. My predoctoral research centered on the intricate mechanisms of tetralin degradation by Sphingomonas macrogolitabida, specifically through the study of Pb-Pc promoters, and the activation by ThnR, a LysR-type transcriptional regulator. This research was pivotal, leading to an EMBO Short-Term Fellowship for visiting Imperial College London, where I expanded my work on ThnR through Cryo-EM. The outcomes of my PhD research were significant, contributing to four publications, including one where I was the first-author, culminating in my PhD thesis with Honors (2014).

My predoctoral stage was marked by extensive learning and application of various scientific techniques within microbiology, genetics, and molecular biology. This scientific background became the cornerstone for my subsequent research endeavors. After finishing my PhD, I joined Dr. Devos's group at the Andalusian Center for Developmental Biology (CABD, CSIC). Here, I spearheaded an experimental research line, a new venture for a group previously focused on computational studies. My work involved the enigmatic Planctomycetes phylum, leading to groundbreaking discoveries and the publication of eleven research articles, highlighting the development of novel genetic tools, a milestone in the field.

My postdoctoral journey was enriched by several international research stays, including a month at Dundee University in the UK, a three-month period at Radboud University in The Netherlands, and shorter visits to Cayetano Heredia Peruvian University and Namur University in Belgium. These experiences not only broadened my scientific expertise but also enhanced my international collaboration network.

Joining Dr. Devos's group posed substantial challenges, notably establishing a new experimental lab and mastering the manipulation of Planctomycetes. My leadership skills were honed as I guided students through their experimental work, leading to a thriving lab environment with two PhD candidates under my mentorship. This period of my career was crucial for developing a blend of research, management, and leadership skills, which facilitated my success in securing independent funding for our projects, including grants from the UPO Research Plan and the FEDER Andalucía program.

My commitment to academia extends beyond research; I am deeply involved in teaching and mentoring, holding the position of Associate Lecturer since 2018, and supervising numerous student projects at both undergraduate's and Master's levels. My dedication to fostering the next generation of scientists is evident in my active co-supervision of PhD students, including international recruits.

Collaboration has been a key theme throughout my postdoctoral stage, yielding fruitful partnerships and publications. My dedication to science communication is unwavering, with a strong commitment to open-access publishing and active engagement in public dissemination through various mediums, including press releases and podcasts, ensuring my research reaches both the scientific community and the public at large.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | PARRA , RODRIGO GONZALO |
| **Referencia:** | RYC2023-043825-I |
| **Correo Electrónico:** | parra.gonzalo@gmail.com |
| **Título:** | Biophysical Characterisation of The Protein Universe: Evolution, Design and Disease |

**Resumen de la Memoria:**

Background: To mechanistically understand protein function is essential to evaluate the phenotypic impact of mutations, protein engineering or drug design. Less than 10% of proteins in Uniprot are experimentally characterized and this is even sparser for functional sites (<1%). Therefore, computational approaches are very much needed to fill this gap. Proteins fold by minimizing their internal conflicts. However, some remain in conflict, i.e. are highly frustrated and have been correlated to several functional aspects. I have developed the FrustratometeR and FrustraEvo tools to understand the role of local frustration in protein biophysics and its interplay with evolution. These tools allow us to find evolutionary constrained regions in protein families, related to stability or function as well as regions that are flexible to vary under neutral evolution. We and several research groups have shown the utility of these tools in different scenarios (e.g. Parra et al, 2015; Freiberger et al, 2019; Freiberger and Ruiz-Serra et al, 2023).

Objectives: I will extend our previous studies to representatives of the entire protein universe to better understand protein evolution, the phenotypic impact of mutations and to guide protein design. We will extend the tools and concepts developed by me in the past years, combining them with state-of-the-art deep learning and natural language processing techniques, to better understand the underlying biophysical principles behind protein function. This research proposal consists of four intertwined aims.

- Aim 1: A survey of energetic constraints in the protein space: Investigate the energetic signatures of a representative portion of protein families across the known protein structural space. We will produce a first assessment of how many constrained and unconstrained regions we can expect to find across proteins, architectures and amino acid types both linked to stability or functional reasons.

- Aim 2: Exploring the biophysical boundaries of protein families: We will evaluate the energetic signatures of the different proteins generated by machine learning methods in comparison with their natural counterparts. We will understand what are the limits of the sequence and structural spaces beyond what evolution has explored. Are the sequence and energetic patterns observed in extant protein families the only possible solution or frozen accidents? Are there alternative solutions to perform the same function?

- Aim 3: Understanding the emergence of differential functional patterns within protein superfamilies: We will study how local frustration and other biophysical properties have diversified over time in extant families from ancestral ones. We will find modules of residues that have co-evolved together to determine subfamily functional properties.

 - Aim 4: The Human proteome-wide evolutionary frustration atlas and its relationship with disease causing SNVs: We will use the methods developed in previous aims to study all proteins contained in the Human proteome to understand which proteins and pathways are under strong evolutionary pressure in terms of stability and function and which ones evolve under neutral drift. We will use the sequence and frustration properties of SNVs across the human proteome to train a machine learning classifier to predict the impact of novel SNVs.

**Resumen del Currículum Vitae:**

My career has been centered in the field of molecular bioinformatics, mainly in protein folding/function and evolution, and single cell multi-omics both developing tools and performing data analysis to answer specific biological questions. I published 20 research articles and 17 editorials (h-index 16, 953 citations).

I did my PhD in Buenos Aires University studying the sequence-structure-dynamics-functions relationships in proteins. I developed methods to analyze symmetry and repetitive patterns in protein structures and to localize and quantify local frustration in protein structures. I combined these approaches to perform the first sequence-structure analysis of the full Ankyrin repeat protein family for which I also performed extensive folding studies. From 2016 to 2018 I was an EMBO long-term postdoctoral fellow with Dr. Johannes Soeding at the Max Planck Institute for Biophysical Chemistry in Goettingen, Germany. There, I moved into the single cell transcriptomics field. I developed MERLoT, a method to study gene expression over cellular differentiation trajectories and I co-developed PROSST, a method to simulate scRNA-seq data. Afterwards from 2018 to 2021, to apply my knowledge in the context of human diseases, I joined the group of Prof. Oliver Stegle as a postdoctoral researcher at EMBL in Heidelberg, Germany. There, I studied the genomic and transcriptomic consequences of genome instability in the chromothriptic Medulloblastoma disease using different types of multi-omics data. In late 2021, I joined the group of Prof. Alfonso Valencia at the Barcelona Supercomputing Center (BSC) where I have been leading a group of researchers, at different career levels, to develop a method to analyze local frustration conservation in protein families and superfamilies. I coordinated an international, multi-laboratories collaboration, recently published in Nature Communications where I am the corresponding author and a preprint with the web-server is under review. I currently lead multiple projects, in collaboration with groups in Latin America, USA and Europe, advancing what constitutes the early stages of this proposal. At BSC I was funded by a Beatriu de Pinos fellowship and currently by an MSCA - Sello de Excelencia ISCIII-Health fellowship. I directly supervise 1 FPI Severo Ochoa PhD Student, another starts in March funded by a collaborative contract with NVIDIA and several master students.

I have developed a strong leadership profile in the global bioinformatics scene. I have been a central leader for the International Society for Computational Biology (ISCB) Student Council (SC) currently serving as its Board of Directors representative. In the last few years, I have transitioned

to leading roles within some very prestigious senior communities in bioinformatics. I am part of the 3DBioifo Elixir community steering committee, the ISCB EDI committee, a working group lead of the ML4NGP COST action and part of the advisory board of the Bioinfo4Women initiative. Since 2023 I am one of the co-chairs for the ISCB 3DSig COSI, which has organized the largest structural bioinformatics conference since 2004.

I have been strongly involved in mentoring. I have supervised 10 MSc. Thesis (3 in Argentina; 3 in Germany; 4 in Spain) and 4 rotation/internship students (in Germany). I currently supervise 1 PhD student and another starts in March.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | SANCHEZ ANDREA, IRENE |
| **Referencia:** | RYC2023-044360-I |
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| **Título:** | Utilization of reductive sulfur cycle for metal recovery |

**Resumen de la Memoria:**

Compounds that are strategical for the development of green technologies, such as rare earth elements (REE), nickel and cobalt, are listed as critical raw materials (CRM). CRM increased demand combined with their supply limitation -due to costly and complex mining and purifying processes from primary ores- has set attention on recovery of CRM from secondary sources. Electronic waste (e-waste) is a promising source for CRM such as cobalt, nickel and REE as many end-of-life products have high CRM content. Nickel-Metal Hydride (NiMH) batteries are selected in this proposal as a model due to their growing application market in electrical cars and to their composition, possessing both types of CRM: light REE (atomic numbers between 57 and 63), and base metals as nickel and cobalt. In this project, I will investigate the application of biological sulfate reduction (BSR) for the combined recovery of REE and Co/Ni from NiMH batteries. While BSR technologies allow for the recovery of critical base metals (such as cobalt and nickel) as metal sulfide precipitates, the removal of REE in BSR systems have been observed, but their fate remains unknown. In RL1, the behavior of REE in BSR will be modelled with all the parameters (pH, temperature, etc.) and metabolites present in BSR systems (sulfide, carbonate, aluminium, carboxylates, etc). Abiotic precipitation and adsorption assays will be performed with the most influential parameters to test and complement the model output in high accuracy. REE also interact with the microbial biomass through biosorption, bioprecipitation, bioaccumulation or bioincorporation. Therefore, microscopic analysis and metal quantifications will be performed to understand REE interactions with BSR biomass. In RL2, I will evaluate the influence of different electron donors (lactate, methanol, hydrogen and a blend of carbon compounds) on BSR performance, metabolite concentration and recovery yields of base metals. For this, four batch reactors will be employed to enrich microbial communities. I will use metagenomics and metatranscriptomics to link microbial dynamics with REE recovery efficiency and investigate suspension, cells and precipitates to close REE balances. The reactor with the highest REE recovery yield will be maintained for integration of Co/Ni recovery in the system by addition of an extra modular reactor in RL3.

**Resumen del Currículum Vitae:**

Dr. Sánchez-Andrea holds a PhD in Microbiology from the Autonomous University of Madrid (UAM, Spain) which she defended with honours (cum laude and awarded with the Extraordinary Doctorate Prize of the Faculty of Sciences). During her PhD, she performed two internships in world-wide reference laboratories, staying 5 months in 2010 in the Laboratory for marine Microbiology in Bremen (Germany), and 6 months in 2011 in the Laboratory of Microbiology of the Netherlands. Then, she received a NASA Planetary Biology Internship award to work on microbial electrosynthesis in the laboratory of Prof. Kenneth Nealson in the University of South California, in Los Angeles.

In her three consecutive post-doctoral positions (2012-2017) at the Laboratory of Microbiology of the University of Wageningen (Netherlands), she became an independent Principal Investigator (PI) leading the sulfur cycle group, which focuses on the study of microorganisms related with the sulfur cycle, with a special interest in acidophiles and their application to biotechnological processes. In 2017, she became Assistant Professor (UD2) and one year afterwards, she was promoted to UD1 based on merits.

She has published 65 research articles being the first author of 14, last author of 24 and corresponding author of 27. She described 4 novel genera and 3 novel species which are key microbial players in attenuation processes with application for bioremediation. The famous video channel VICE Motherboard featured her research in a documentary with further publication in Tweeter, Instagram and Facebook. She has discovered novel pathways in the nitrogen, sulfur and carbon cycles. Worth of special mention is her discovery of the 7th pathway for CO2 fixation, the glycine reductive pathway, in the sulfate reducer Desulfovibrio desulfuricans. This textbook changing discovery received a lot of attention for what she got the Research award 2021 from Wageningen Fund Academy for the best paper of the year and was interviewed for journals AS Resource and Wageningen World.

She has secured funding being awarded with 5 research proposals as PI counting with an impressive international collaborative network of renown scientists and in collaboration with companies (Paques, Paquel, RioTinto, etc). She obtained the first position in the Individual fellowship Ramon y Cajal (2022) however she needed to desist due to external circumstances. Her group has consisted of 3 technicians, two post-docs and 8 PhD students. Three of her PhD students already defended their doctoral thesis, two more will do in Spring 2024, and they currently have a Tenure-Track, have secured postdoctoral positions or fixed Jobs in research institutes. One post-Doc obtained a Maria Zambrano fellowship to become a group leader in the University of Valladolid. Dr. Sanchez-Andrea has been involved for 15 years in educational activities as coordinator and/or lecturer in Master and bachelor' s courses. She also organizes the biannual EMBO Practical Course: Breathless microbes on anaerobic cultivation techniques and is keenly organizing conferences or symposiums such as Novel Anaerobes. She has been active in dissemination activities such as writing a blog for Oxford University Press Blog, or collaborating in books such as Afvalwater, hoe maken we de cirkel weer rond?. Her expertise is reflected in edition of special issues or being editorial board member for renown as well as being reviewer of international project proposals.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Biociencias y biotecnología
**Nombre:** QUILES PUCHALT, NURIA
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**Título:** Deciphering the molecular mechanisms governing quorum sensing systems associated to mobile genetic elements

## Resumen de la Memoria:

My research lab will focus on the study of the molecular mechanisms controlling the quorum sensing systems present in different mobile genetic elements (MGEs). The study of communication systems carried by MGEs, such as bacteriophages belongs to a relatively new area of research, with outstanding potential that is still in its early days of development. The aim of my new research group is to establish the fundamental knowledge needed to understand how these systems work and pave the way for the manipulation of these systems in the future to be used as tools for antimicrobial treatments. To this end, I started in 2019 a new line of research characterising the arbitrium system, a phage-QS system discovered in phages of the SPbeta family infecting Bacillus subtilis. The phage encoded QS system was shown to be involved in the decision-making process between the two lifestyles the phage could establish: lysis or lysogeny. Recent research has shown that this was not an isolated case. On the contrary, this strategy seems to be widespread in the genera Bacilli, with similar QS systems present not only in phages but also in other MGEs and in other species of Bacilli, some of them of clinical relevance such as B. cereus and B. anthracis. The diversity of arbitrium systems found in phages, plasmids and integrative and conjugative elements is outstanding, and can be grouped into up to 10 different clades or families. Remarkably, it has been shown that similar phage-QS systems can also be found in phages infecting Gram-negative bacteria such as in Vibrio cholerae where the phage VP882 manipulates the host QS to control its own lytic-lysogenic genomic switch. This discovery suggests that phages rely more than previously thought on the use of communication systems to control the lysis-lysogeny decision and that these findings are only the 'tip of the iceberg' and with time, new systems will be discovered in other bacteria.

On the one hand, I plan to continue working in the molecular characterization of the arbitrium operon described in phages of the SPbeta family, trying to decipher the role in the lysis/lysogeny decision of the genes present in "SPbeta repressor operon". I will also investigate which is the role of the host SOS response in the activation of the lytic cycle of the phage. On the other hand, I believe this communication systems could be present in other bacteriophages and other MGEs that infect other bacteria. This will be remarkable but feasible as we have only uncovered and mechanistically dissected a handful of phages that serve us as models, while there are still many other elements waiting to be studied. In short, I plan to expand our knowledge of the communication systems present in mobile genetic elements. Only after we acquire this knowledge, we will gain fundamental insight about how to exploit these phage communication systems and use these phages as antimicrobial tools.

## Resumen del Currículum Vitae:

My research work has focused on understanding the molecular mechanisms employed by bacteriophages to promote its own dissemination and mediate the transfer of bacterial DNA specially focusing on the impact it has in the pathogenicity of the host. I obtained a predoctoral fellowship from the Generalitat Valenciana to study the horizontal transfer of genetic information in Staphylococcus aureus under the supervision of Prof. José R. Penadés. During my PhD I worked on different projects to understand the packaging process using bacteriophages infecting S. aureus as models. As a result of my PhD, I published 3 papers as a first author or joint first author in top journals of the microbiology field and 1 paper as a second author. I obtained my PhD in 2013 and I was awarded the outstanding doctorate achievement award by the Universidad CEU Cardenal Herrera.

In 2014 I started working as a postdoctoral researcher at the University of Glasgow. Amongst other work, I was involved in the discovery of a new phage-mediated bacterial DNA transduction mechanism (Chen et al., 2018). The gene transfer rates observed using this new mechanism of transduction, named lateral transduction are exceedingly high compared to the previous ones described, making it one of the most important contributor factors to the rapid evolution of bacteria (Humphrey et al., 2021).

In 2019 I started leading a novel line of research in a newly discovered area in the field of mobile genetic elements interactions, investigating communication systems present in bacteriophages infecting B. subtilis. This effort continued in 2021 when I moved to the Centre for Bacterial Resistance Biology (CBRB) Imperial College London, and it has crystallized from 2023 at Universidad CEU Cardenal Herrera where I have started my new independent research group. The initial results of this line of research have resulted in four publications (Brady et al., 2021; Gallego del Sol et al., 2022, Brady et al., 2023 and Zamora-Caballero et al., 2024).

Overall, during my postdoctoral training (2014 -2022) I have participated in collaborative projects that resulted in a total of 13 peer reviewed papers, 6 as first author or joint first author in very prestigious journals including Science and PNAS. I have published one book chapter as a corresponding author, and 2 review articles, one of them as co-corresponding author.

I have co-supervised four PhD student Theses; two PhD students graduated in 2019, one graduated in 2021 and one graduated in 2023. They have continued their research careers, either as independent Fellows or assistant professors in their universities. Currently, I am the main supervisor of one PhD student that has started her PhD Fellowship in my research group in November 2023. I have presented my work in several national and international meetings with 2 oral communications as guest invited speaker and 14 posters presentations. I have participated in several research projects in Spain and UK, in one of them as researcher Co-Investigator, helping managing and leading the project. I have been awarded one competitive 3 year-grant from the "Proyectos de Generación de Conocimiento 2022" call from the Spanish Ministry of Science and Innovation (Funded value: 133.125 €) which will help me towards establishing my independent research niche.

**Área Temática:** Biociencias y biotecnología
**Nombre:** KARAKOSTIS , KONSTANTINOS
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**Correo Electrónico:** konstantinos.karakostis@gmail.com
**Título:** Molecular evolution of synonymous mutations and signalling pathways

**Resumen de la Memoria:**

My research plan is to expand my ongoing work on the effect of synonymous mutation (SMs) on the p53 tumour suppressor and to investigate the broader mechanism adopted by the cell, whereby mRNA secondary structures govern gene activation and cell regulation of several genes, while evaluating the carcinogenic activity and the physiological significance of these SMs. The effects of the SMs will be addressed both at the structural/molecular level and at the cell signalling/mechanistic level. The core objective is to progress towards a deep and broad understanding of the implications of key SMs in the regulation of stress response pathways, using the p53 as a model and to exert a better understanding of the SM mechanisms impeding gene activation. This mechanism is linked to cancer aetiology and progression, and findings will make use of an extended clinical potential of diagnostic testing. My most recent publication Karakostis K et al, 2024 in the highly prestigious journal of Molecular Cancer (IF: 41.4), entitled: "The DNA damage sensor ATM kinase interacts with the p53 mRNA and guides the DNA damage response pathway", is highly indicative of the quality of this research area. Furthermore, during my post-doctoral research I have gained expertise on the p53 model and the molecular evolution of the p53-MDM2-ATM pathway, and I have developed several still active collaborations with top experts in the field of p53 and/or in the related fields I have approached during this time. I have shared publications with all these collaborators, including from Oxford University, INSERM, Masaryk Cancer centre, Edinburg University and more. In most of these publications I am either first, last, corresponding author. For the needs of this extended project that spans across cell signalling, developmental, molecular biology and evolution, microscopy and biochemical assays, I have employed several human cell lines, pre-vertebrate embryos (Ciona intestinalis) and developed a new elephant fibroblast cell line. The outcomes are highly significant in several ways, but what intrigues me the most is the evidence I have been presenting on the uprising roles of secondary mRNA structures, altered by synonymous mutations (and also non-synonymous). The conceptual and mechanistic implications of these are potentially groundbreaking for Cell biology. Regarding my trajectory, see the documents "Resumen del curriculum" and "CVA". This project, as described in the document "Formato Memoria" will include three interlinked approaches: Genomic, Molecular (signalling) and Translational, to address the functional roles of SMs altering secondary mRNA structures. The implicated mechanisms and the molecular evolution of their interactions will be studied initially using the well-studied p53 pathway used as a model. In conclusion, this line-of-research, will revolve around fundamental molecular mechanisms of cell regulation using the p53 pathway as a model with the aim to achieve breakthroughs in the function of the mRNA in cell regulation. Yet, the findings are also assets for biomedical research as it links mutations with mechanistic studies, to address structural and functional roles of variants found in cancers, advancing the exploitability in translational research.

**Resumen del Currículum Vitae:**

Regarding my trajectory, I have worked on the proposed project in several labs around Europe; I am awarded with two Seals of Excellence for related projects I have submitted in Marie Curie Individual Fellowships; I am currently a Maria Zambrano fellow in IBB (UAB) and the IMIM (PRBB) in Barcelona and I am certified with the AQU Accreditation for Associate Professor. Finally, I have a total of 22 publications in 15 of which I am corresponding and first or last author, while I am the main PI of a project funded by the Save the Elephants association (Budget: €130,000 in total). My work has revealed highly significant and ground-braking concepts for the field, including a novel mechanism whereby the p53 mRNA guides MDM2 and ATM kinase to the p53 polysome following DDR to phosphorylate and activate the nascent p53 protein. Also, an example shown for the first time of synonymous mutation found in cancers, altering the secondary p53 mRNA structure thus preventing the MDM2-induced translation of p53. Such roles of the secondary mRNA structures have started to unravel in the literature since this pioneer publication on 2019. My latest findings on the mechanism, whereby the p53 mRNA links the p53-MDM2 pathway with the ATM-H2AX-MRN complex are published in the high impact factor journal of Molecular Cancer, IF: 41.4. In addition I have published findings of this project in J Mol Cell Biol, Nucleic acids research, BMC Cancer, Journal of Pathology, Oncogene and more; and I am first and/or corresponding author in most of them. Furthermore, I have focused on the molecular evolution of the p53-MDM2 components and have published highly impactful findings in the top for the field journal Molecular Biology and Evolution (2 papers), as corresponding and first/last author. I have also worked in translational project and in industry as R&D Director, where I developed a novel IVDD certified pharmacogenetic test that was implemented in the clinic and I have published the results. More detailed description of my CV is mentioned in the document "CVA".

**Área Temática:**     **Biociencias y biotecnología**
**Nombre:**            SERRANO ALVAREZ, ESTER
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**Título:**            Horizontal gene transfer mechanisms and anti-virulence targets

**Resumen de la Memoria:**

Antibiotic resistance is a global health emergency, with resistance detected to all antibiotics currently in clinical use and only a few novel drugs in the pipeline. A comprehensive understanding of all the mechanisms that contribute to the transfer of antibiotic resistance genes is an important unanswered problem. I have dedicated most of my scientific career to trying to contribute to a better understanding these processes. For 11 years, (2010-2021) my work focussed on the study of all the horizontal gene transfer (HGT) mechanisms that bacteria use to exchange genetic information and, therefore, use to spread not only antibiotic resistance genes, but also virulence genes and metabolic pathways. HGT occurs via three basic mechanisms: conjugation, natural transformation and transduction. For the study of these three mechanisms, I have worked in 4 laboratories in 3 different countries (Spain, Japan, and United Kingdom) from my undergraduate to my second Postdoctoral periods (2010-2021) where I acquired skills in different fields (microbiology, molecular biology, and biochemistry).

First (2010-2013), I studied conjugation using Bacillus subtilis as a model organism. For 3 years at the Severo Ochoa Centre for Molecular Biology (CBMSO, Madrid, Spain), I collaborated in the characterization of the proteins involved in the conjugative transfer of plasmids pLS20 from B. subtilis and p576 from B. pumilus NRS576.

In 2013, I started working at the National Centre for Biotechnology (CNB, Madrid, Spain) to do my PhD. In 2018, I defended my thesis obtaining the title of Doctor in Molecular Biosciences by UAM. During my PhD and my first Postdoctoral position, my main research line was the study of different aspects of natural transformation in B. subtilis. Additionally, during my PhD, I spent 3 months at the Graduate School of Biostudies in Kyoto, to learn a technique and perform some key experiments for my project.

In 2019, I moved to Glasgow (United Kingdom) where I started a Research Assistant position at University of Glasgow (UofG). Here, I studied transduction, the third main mechanism of HGT. Staphylococcus aureus was used in this project as model organism. During my investigations in this group, we described for first time a new mechanism of HGT mediated by Staphylococcal pathogenicity islands (SaPIs) which we termed lateral co-transduction.

In 2021, I started my current position as Research Associate at UofG. Here, I continue in the battle against antibiotic-resistant bacteria but am approaching the study from a different angle. Instead of trying to avoid the spread of antibiotic resistant genes, my current aim is to develop alternative strategies to the use of antibiotics. The model organism that is the subject of my current project is Enterohemorrhagic Escherichia coli (EHEC). To successfully develop the project, during the last years, I have been learning structural biology and biophysics techniques necessary for the study.

Finally, to fund my own research line in early 2023, I was awarded a grant (£5k, 6 months) by the Glasgow Children's Hospital Charity. Thanks to this funding, I drove my own project as Principal Investigator (PI) to explore a new method for a better screening of anti-virulence compounds to treat EHEC infections, using super resolution single molecule and FRET microscopy.

**Resumen del Currículum Vitae:**

I studied for both a B.Sc. in Biology and an M.Sc. in Microbiology at the Universidad Autónoma de Madrid (UAM) (Spain). In 2010, during the last year of my B.Sc., I started working at Dr. Wilfried JJ Meijer's laboratory at the Severo Ochoa Centre for Molecular Biology (CBMSO, Madrid, Spain) where I was for 3 years.

In 2013, I started working in Prof. Juan C. Alonso's laboratory at the National Centre for Biotechnology (CNB, Madrid, Spain) to do my PhD. To fund my PhD, I obtained a 4-year PhD student grant "Ayudas para contratos predoctorales para la formación de doctores" (FPI) awarded by the Spanish Ministry of Economy and Competitiveness (MINECO) starting in January 2014. During my PhD, we collaborated with groups from Spain, Singapore, and Japan. Indeed, to perform experiments necessary for the development of the project, I obtained an internship grant from MINECO. Thanks to this funding, I had the opportunity to stay for 3 months (March-May 2015) in Kyoto (Japan) to learn a technique and perform the corresponding experiments in the lab of Prof. Kunio Takeyasu at the Graduate School of Biostudies, Chemistry. During my PhD, I acquired skills in different fields (microbiology, molecular biology, and biochemistry). In 2018, I defended my PhD thesis with Magna Cum Laude and International PhD mentions obtaining the title of Doctor in Molecular Biosciences by UAM. Then, I continued for one year in the same laboratory as Postdoctoral Researcher.

In 2019, I moved to Glasgow (UK) to work as a Research Assistant in the School of Infection and Immunity at the University of Glasgow (UofG) under the supervision of Prof. Jose R. Penades.

In 2021, I started my current position as Research Associate in the School of Infection and Immunity at UofG under the supervision of Prof. Andrew J. Roe and Prof. Olwyn Byron. Nowadays, I am carrying out my own project which has introduced me into the field of biophysics. To fund my own research line in early 2023, I was awarded a grant from the Glasgow Children's Hospital Charity (£5k, June-November 2023) to lead an independent side project as Principal Investigator, in collaboration with a group from the University of Edinburgh.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

During my scientific career (2010-present) I have worked in 5 laboratories in 3 different countries (Spain, Japan, and United Kingdom), publishing my work in 1 book chapter and 21 peer-reviewed papers (h-index=10, 234 citations), including one paper last year (2023) in Cell journal (impact factor 64.5). Recently, I submitted a preprint manuscript as corresponding author to be published in early 2024. In addition, I shared my results with the scientific community by participating in several international congresses. Also, for the development of my scientific career, I have supervised more than 10 students from different countries and at differing education levels. Additionally, I taught courses in microbiology and biochemistry for undergraduate biology students at UAM (2014-2016) and lectured on "Core Skills in Microbiology" course for Honours students at UofG (2022-2023). Also, in 2022, I was President of the Committee for a PhD viva defence at UAM. Finally, for two consecutive years (2023-2024), I was selected to be part of the recruitment panel for the UofG Wellcome Trust Integrative Infection Biology PhD, a very prestigious international programme.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | NAJLE QUINTERO, SEBASTIÁN |
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| **Correo Electrónico:** | sebasnajle1@gmail.com |
| **Título:** | Decoding the Minimalist: Molecular Characterization of Placozoan Cellular Organization |

**Resumen de la Memoria:**

I am a biologist with expertise in biochemistry, eukaryotic molecular biology and evolution. Since the beginning of my scientific career, I have been interested in understanding the molecular intricacies leading to the amazing diversity of cells, and how this cell type diversity translates into organismal phenotypes.

During my undergraduate and doctoral studies, I specialized in microbial lipid metabolism. As an undergraduate, I dissected the mechanism of transcriptional regulation of a fatty acid desaturase in response to cold stress in the bacterium Bacillus subtilis. During my PhD in Dr. Antonio Uttaro laboratory at IBR-CONICET (Argentina), I took the first steps towards independence by setting up a new branch of research in the laboratory to study the metabolism of sterols in the ciliate Tetrahymena thermophila. I identified and characterized the genes encoding key enzymes involved in this pathway, including a Rieske-like oxygenase that converts cholesterol into pro-vitamin D3, of biotechnological interest. After obtaining my PhD, I continued with my research line as a Postdoctoral Fellow (CONICET), including a stay at Dr. Claudio Slamovits laboratory (Dalhousie University, Canada), where I applied RNA-seq to complete the identification of the full set of genes for sterols metabolism in T. thermophila.

Later, I achieved a milestone in my career by securing a PI position as Associate Researcher from CONICET. During this post, my interest in evolutionary cell biology prompted me to comparatively study a different model system, the filasterean amoeba Capsaspora owczarzaki, where I described a novel pathway for the conversion of diet cholesterol into ergosterol. Additionally, I conceived and led a project in environmental sampling and identified potential new candidate model species to study the origin of multicellularity.

In 2015, I took a leave from my PI position and moved to Dr. Iñaki Ruiz-Trillo laboratory (IBE-CSIC, Barcelona) as a Postdoctoral Researcher, where I focused on the question of the origin of animal multicellularity and approached it from multiple perspectives. I had a fundamental role in establishing a platform of genetically tractable model systems in three different unicellular holozoan lineages (animals' closest relatives), a major need to further investigate animal origins. Furthermore, I lead the design and implementation of protocols for CRISPR/Cas9 genome editing in some of those lineages, as part of a PhD candidate's project that I co-supervised with Dr. Ruiz-Trillo. I also contributed to different projects aimed at studying the evolutionary history of diverse gene families and metabolic pathways in this clade.

More recently, as a Senior Postdoctoral Researcher in Dr. Arnau Sebé-Pedrós lab (CRG, Barcelona), I specialized in single-cell RNA-seq.  I have adapted different scRNA-seq protocols, together with other advanced techniques such as HCR hybridization and shotgun proteomics, and successfully applied them to study the origin and evolution of the neuronal gene expression module in early-branching animals.

My future research program, supported by my strong theoretical and experimental background, will investigate the mechanisms of multicellular organization in placozoans and to establish them as model systems amenable to genetic manipulation.

**Resumen del Currículum Vitae:**

I hold a Degree in Genetics (2006) by the National University of Misiones (Argentina) and a PhD in Biological Sciences (2012) by the University of Rosario (Argentina). Funded by two competitive fellowships (ANPCyT and CONICET), I pursued my PhD in the laboratory of Dr. Antonio Uttaro at IBR-CONICET, Argentina, where I described key genes involved in the metabolism of sterols in the ciliate Tetrahymena thermophila.

After obtaining my PhD, I was awarded a highly competitive CONICET Postdoctoral Fellowship (2012) to continue my research on T. thermophila. Also, in 2013 I was awarded a Short-Term Fellowship (CONICET) to stay at Dr. Claudio Slamovits laboratory (Dalhousie University, Canada), to complete the characterization of this pathway using RNA-seq.

Later, as Associate Researcher (PI) in IBR-CONICET, I described a novel pathway for sterols metabolism in the amoeba Capsaspora owczarzaki. Additionally, I was awarded a grant from the AMNH (USA) to study, in collaboration with Dr. Eunsoo Kim, the molecular diversity of microbial eukaryotes in the Paraná River (Argentina) with a focus on unicellular Opisthokonta.

In 2015, as a Senior Postdoctoral Researcher at Dr. Iñaki Ruiz-Trillo laboratory (IBE-CSIC, Barcelona), I expanded my spectrum of model systems and experimental skills. I used a multifaceted approach to tackle the question of the origin of animal multicellularity, contributing to the development of efficient protocols for transgenesis in diverse unicellular holozoans (animals' closest relatives). Moreover, I contributed in understanding the evolutionary history of multicellularity-related genes in these lineages. In addition, funded by an EMBO-STF and a SEG Fellowships, I stayed at Dr. Linas Mazutis laboratory (Vilnius University, Lithuania) to learn inDrops scRNA-seq method. Based on this training, I setup inDrops in the PRBB and applied it to study cell type differentiation in unicellular holozoans.

More recently, I moved to Dr. Arnau Sebé-Pedrós laboratory (CRG, Barcelona), where I specialized in single cell genomics technologies and applied them to unicellular holozoans and early-branching animals to study the origin and evolution of animal cell types. Noteworthy, some results from these projects were included in a paper as first author recently published in Cell.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

My passion for science has always guided me to confront very challenging and risky projects. Despite this, my past research has so far resulted in 16 publications (15 articles and 1 book chapter), including high impact journals (Cell, Nat. Biotech., Curr. Biol., Nat. Methods, Mol. Biol. Evol.), being the first author in 7 of them and corresponding author in 3. The collaborative nature of my projects, as well as my intensive activity in international conferences, have provided me with a valuable network of collaborators around the world working on diverse systems and methodologies. Furthermore, I have ample experience in mentoring undergraduates, 4 MSc and 1 PhD students at different universities, as well as more than 10 years of experience in academic teaching at graduate and undergraduate levels.

Overall, I am convinced that my intellectual independence, collaborative and mentoring experience, and research interests and dexterities put me in a solid position to successfully establish and manage my independent research under the Ramon y Cajal program.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Biociencias y biotecnología
**Nombre:** JUÁREZ CARREÑO, SERGIO
**Referencia:** RYC2023-044116-I
**Correo Electrónico:** sjuarezcarreno@gmail.com
**Título:** Inter-organ regulation of neuroendocrine growth: Implications for development and adult fitness

**Resumen de la Memoria:**

The Ramón y Cajal Fellowship represents a compelling opportunity for the advancement of my career as an independent researcher within a prestigious Spanish institution. My research trajectory attests to my proficiency in delivering high-quality, original, and impactful scientific contributions, coupled with a demonstrated ability to secure funding, collaborate effectively within a team, and assume leadership roles.

In my earlier academic pursuits, I conducted my thesis under the mentorship of Dr. Maria Dominguez and Javier Morante at the Instituto de Neurociencias de Alicante. My focus was on addressing critical questions in developmental biology using Drosophila as a model organism. Firstly, I investigated the mechanisms by which organisms synchronize body size and organ growth to maintain bilateral symmetry and proportional development. This led to the identification of the relaxin receptor Lgr3 as a crucial mediator, orchestrating developmental timing and growth rates through the regulation of sterol hormones and insulin-like peptides. The outcomes of this research were published in the prestigious journal Science, where I served as a co-first author, and in an invited review on developmental stability in Cell Stress.

Secondly, my investigations centered on understanding how organisms monitor nutritional reservoir levels for the initiation of sexual maturation. I characterized Sema1a as a body fat sensor, interacting with Apolpp to regulate maturation initiation post the critical weight checkpoint. This research, where I served as the first author, was published in Cell Reports.

Subsequently, as a research associate at Memorial Sloan Kettering Cancer Center (MSKCC) in Frederic Geissmann's lab, I delved into the unresolved question of why macrophage depletion during development results in sterile animals with inhibited growth due to impaired sterol hormone synthesis. My work identified Pvf2-derived macrophages as key mediators of the developmental timing program, interacting with the receptor Pvr in the prothoracic gland to regulate sterol hormone synthesis gene expression and ecdysone hormone biosynthesis. This study, where I served as the first author and co-corresponding author, was published in Science Advances.

Presently, as a researcher at IRB Barcelona in Marco Milan's lab, I am expanding my studies on how macrophages regulate physiology during development under unhealthy nutritional conditions. My primary focus is to delve into the intricate mechanisms by which macrophages mediate inter-organ communication, significantly contributing to homeostasis in both physiological processes and pathological conditions. My research aims to intricately investigate the complex network of inter-organ communication involving macrophages, shedding light on how their dysregulation under external cues impacts and contributes to pathology.

Through the Ramón y Cajal Fellowship, my objective is to explore the fundamental role of macrophages in controlling sterol hormone biosynthesis under inflammatory conditions induced by high-sugar diets, while also examining potential trade-offs that may arise under challenging conditions. The translational potential of these findings holds promise for advancing biomedical strategies in the treatment of pathologies such as obesity, infertility, and cancer.

**Resumen del Currículum Vitae:**

Since the inception of my PhD training, I have recognized the importance of fostering international collaborations and establishing connections with prominent researchers to enrich my scientific education. Demonstrating a commitment to global engagement, I have maintained prolific international mobility throughout my entire research journey.

My doctoral research, titled "The Neuroendocrine Control of Animal Size, Symmetry, and Proportions," was conducted under the PhD Fellowship training program for researchers (FPI) at the Instituto de Neurociencias de Alicante (UMH-CSIC). This institution, a Severo-Ochoa center of excellence, is renowned for its expertise in studying growth control mechanisms using Drosophila as a model organism. As part of my PhD studies, I was awarded a Predoctoral Fellowship for a short inquiry at The Rockefeller University in New York, a world-leading biomedical research institute with 26 Nobel Prizes attributed to its groundbreaking discoveries. At Rockefeller University, I served as a PhD visitor student in Leslie Vosshall's lab, a distinguished research group specializing in Drosophila behavior.

After completing my doctoral degree, my curiosity led me to undertake a portion of my postdoctoral training in New York, where I focused on gaining insights into how macrophages interact with their environment and regulate physiology beyond infection. Serving as a CRI Irvington Postdoctoral Fellow in the Frederic Geissmann lab at Memorial Sloan Kettering Cancer Center (MSKCC), a highly esteemed laboratory in tissue-resident macrophage biology, I established my independent research line. MSKCC, with over 130 years of history, is recognized as one of the largest and most successful cancer institutions in the United States, excelling in patient care, innovative research, and educational programs.
Currently, I have returned to Spain as a recipient of the Beatriu de Pinós Postdoctoral Fellowship at IRB Barcelona, where I am pursuing an independent position while continuing my research focused on macrophages and their role in sustaining homeostasis.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

My research achievements are evident in publications where I served as the first author and co-corresponding author in high-impact factor journals, including Science, Cell Reports, Science Advances, and Nature. Furthermore, my international exposure is underscored by experiences as a PhD visitor student at Rockefeller University, a CRI Postdoctoral fellow at MSKCC, and a Beatriu de Pinós postdoctoral fellow at IRB Barcelona. Additional recognitions include the Extraordinary Neuroscience Doctorate award, twice being a Student Poster Prize-Runner up in international meetings, and being selected three times for short talks in such conferences. I have actively participated in teaching activities, guiding a Master's thesis at the Universidad Internacional de Valencia and imparting knowledge through teaching lab protocols and project presentations to fellow lab colleagues, many of whom are co-authors in my publications. My involvement in outreach activities during Brain Awareness Week reflects my dedication to science communication. As a young researcher, I am confident in demonstrating both the quality and efficiency required for independent research.

**Área Temática:** Biociencias y biotecnología
**Nombre:** GARCIA PARDO, JAVIER
**Referencia:** RYC2023-045211-I
**Correo Electrónico:** javiergarciapardo@msn.com
**Título:** Molecular Basis of Disease and Drug Discovery

**Resumen de la Memoria:**

My main research interest is to elucidate the molecular mechanisms of essential biological processes associated to human diseases. Throughout my research career, I acquired an extremely interdisciplinary background that range from structural biology to molecular and cellular biology, computational biology, and nanobiotechnology. My PhD focused on the characterization of regulatory and digestive carboxypeptidases in the group of Prof. FX Avilés at the Institut de Biotecnologia i de Biomedicina (UAB, Spain). In this context, I particularly focused my research on the structural and functional characterization of proteins and large macromolecular complexes. The results derived from my PhD work led to the publication of nine peer-review scientific articles, five of them as first author, and an extraordinary thesis award.

During my scientific career, I gained international experience with long contracts and stays in research centers of excellence from Europe and U.S.A. In 2016, I visited the lab of Prof. emeritus Sir. T Blundell (University of Cambridge, UK), a pioneer and eminence in the field of structural biology. This EMBO-founded collaboration allowed me to obtain exceptional skills in structural biology and cryo-EM, that I have later applied in my postdoctoral career. In this period, I solved the structure and function of carboxypeptidase O (CPO), a novel membrane-bound digestive enzyme with a substrate specificity towards peptides with C-terminal acidic residues. This discovery has crucial implications for the digestion of dietary proteins and peptides, in which CPO complements the function of other well-known digestive enzymes.

In 2017, I moved to the laboratory of Prof. D. Ruiz-Molina at the Catalan Institute of Nanoscience and Nanotechnology. In his laboratory I had the major opportunity to merge material science with biological sciences. By exploiting the extraordinary properties of coordination polymers, I managed to develop novel bioinspired dopamine-based coordination nanoparticles and promisingly adopt such material for an efficient nose-to-brain dopamine administration. This technology gave rise to a recent high impact factor publication (Garcia-Pardo J et al. ACS nano. 2021). In addition, this collaboration led to the publication of other five peer-review scientific articles in the fields of Life Sciences and Nanotechnology. I continued my scientific career abroad in the laboratory of Prof. Dr. Ivan Dikic (Goethe University Frankfurt, Germany), who is one of the world's leading experts on Autophagy and Molecular Cell Signaling. Thanks to this collaboration, we have published two major publications in Nature Communications (2019) and Cell Chem Biol (2020).

In 2021, I received the prestigious JdC Incorporación grant, and I returned to IBB, where I have stablished novel research lines focused on the structural characterization of amyloids fibrils using state-of-the-art cryo-EM. Using this approach, we have determined the first cryo-EM structure of a full-length human RNP amyloid (hnRNPDL-2) at 2.5 A resolution. This work has been recently published in Nature Comms (Garcia Pardo J et al. Nat Commun. 2023). Ultimately, our structure represents a milestone in the field and provides the molecular basis for mechanistic understanding of how functional proteins self-assemble into a variety of functional and pathologic amyloid species.

**Resumen del Currículum Vitae:**

Dr. Javier Garcia-Pardo received two bachelor's degrees in biology (2009) and in Biochemistry (2010) from the Universitat Autònoma de Barcelona (UAB). Following completion of the undergraduate studies, he got a master's degree in the field of Biochemistry, Molecular Biology and Biomedicine from the same university. During his PhD (2011-2015) at the UAB, he worked under the supervision of Prof. Dr. F.X. Avilés at the Institut de Biotecnologia i de Biomedicina (IBB) pursuing the structural and biochemical characterization of metalloproteases and their inhibitors. He did his first research stay for over 6 months at the Albert Einstein College of Medicine (New York, USA) with the aim to study the substrate specificity of peptidases using quantitative mass spectrometry. Thanks to his outstanding scientific contributions during the PhD period, he obtained the grade "Excellent cum laude" and was granted with an extraordinary doctoral thesis award from the UAB.

During his initial investigations, J. Garcia-Pardo worked with large macromolecular protein assemblies. By using X-ray crystallography, he elucidated the structural basis that underlies the substrate specificity of carboxypeptidase O. This outstanding discovery was carried out in collaboration with the Nobel laureate Prof. R. Huber (Max Planck Institute, Munich, Germany) and with Dr. D. Reverter (IBB-UAB). During this year, he was also visitor scientist at the laboratory of Prof. emeritus Sir. Tom Blundell (University of Cambridge, UK). In 2017, Javier Garcia established an important collaboration with Prof. D. Ruiz-Molina, and he moved to the ICN2 to continue his postdoctoral scientific research in the field of Nanotechnology and Nanomedicine. He worked in the development of novel nanostructured polymeric materials to treat Parkinson's disease and other human diseases. Afterwards, he moved to Frankfurt am Main to join the group of Prof. Dr. Ivan Dikic at the Buchman Institute for Molecular Life Science (BMLS, Frankfurt, Germany), where he focused on the study of reticulons. He also worked in the identification of new compounds targeting inflammation and the NF-kB pathway. In 2021, J. Garcia-Pardo received the prestigious JdCI grant and joined the IBB, where he stablished state-of-the-art technologies dedicated to cryo-EM analysis of large macromolecular assemblies. He is working in the structural characterization of functional and pathological amyloids fibrils using this technique. Overall, an outstanding research career of J. Garcia-Pardo was being focused on understanding the molecular mechanisms that underly the development of various human diseases. Accordingly, he has participated in 25 National and International research projects in the fields of Biotechnology and Life Sciences, and he has published over 37 peer-reviewed articles (14 in last two years, 86% as first and/or corresponding author) in top journals, including Nature Chemical Biology, Nature Communications, Trends in Biochemical Sciences, ACS Nano, PNAS, Nanoscale, Chemical Engineering Journal and MCP. He also collaborated with the Department of Biochemistry and Molecular Biology (UAB) as a volunteer lecturer. He directed a PhD student and mentored several master and undergraduate students. He is member of the reviewer board of IJMS, guest editor of Pharmaceutics and reviewer for over 20 top-ranked scientific journals.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | BLANCO TOURIÑÁN, NOEL |
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| **Correo Electrónico:** | noel.blancotourinan@unil.ch |
| **Título:** | Environmental regulation of root development |

**Resumen de la Memoria:**

I have almost a decade of experience studying plant development, motivated by understanding fundamental biological processes of biotechnological significance. During my PhD (2015-2020), supervised by Profs. Miguel Á. Blázquez and David Alabadí (IBMCP, CSIC-UPV, Spain), I focused on understanding how plants regulate gene expression in response to environmental stimuli. This resulted in 14 scientific publications, including three research articles (one in PNAS and two in Plant Physiol) and two review articles as the first author, and nine research articles as co-author (in Nat Plants, PNAS, Nucleic Acid Res, EMBO Reports, etc.). Remarkably, I discovered an unexpected regulatory mechanism of DELLA proteins during my PhD. The scientific community has widely accepted that DELLAs are mainly regulated by the phytohormones gibberellins (GAs) for the last three decades. However, my PhD research challenged this view by showing that DELLAs are also regulated by a GA-independent mechanism involving the activity of the E3 ubiquitin ligase COP1. During my PhD, I also visited three other labs at Paris-Saclay (France), École Normale Supérieure (France), and Durham University (UK), and these interships were essential for publishing one of the manuscripts of my PhD. In the context of these works, I have supervised two undergraduate theses and one master thesis.

After defending my PhD in 2020, I joined Prof. Antia Rodriguez-Villalon's lab (2020-2022) at ETHZ in Switzerland. My research focused on vascular development in plants, resulting in five scientific publications, including three as a first/co-corresponding author (in Curr Biol, Development and STAR Protocols) and two as a co-author (in New Phytol and Methods Mol Biol). During my postdoc at ETHZ, I made a discovery that marked a paradigm shift in the lateral root field. In the model plant Arabidopsis, the primary root pericycle was thought to be the sole driver of lateral root formation. However, I challenged this by revealing that the procambium also contributes through its influence on xylem connections. In 2022, I joined Prof. Christian Hardtke's lab (University of Lausanne, Switzerland). I have recently published a review as co-corresponding author in Curr Opin Plant Biol about vascular connections in plants. In my postdoc at UNIL, I combine tissue-specific transgene knockout, single-cell RNA-sequencing analyses and synthetic biology to understand the role of several receptor-like kinases in root growth.

**Resumen del Currículum Vitae:**

I obtained my PhD in the Polytechnical University of Valencia in 2020 under the direction of Profs. Miguel Á. Blázquez and David Alabadí. As a result of my PhD work, I published 14 articles, in journals that include PNAS, Nat Plants, Nucleic Acid Res, EMBO Reports, Plant Physiol, etc. Later I joined Prof. Antia Rodriguez-Villalon's lab (2020-2022) at ETHZ in Switzerland. During this period, I published five scientific publications in Curr Biol, Development, New Phyt, among others. In 2022, I joined Prof. Christian Hardtke's lab at the Department of Plant Molecular Biology (DBMV, University of Lausanne). I have co-supervised two undergraduate theses and one master thesis. Moreover, I have been actively involved in teaching, outreach and in the organization of national and international conferences.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Biociencias y biotecnología
**Nombre:** KARKALI , AIKATERINI
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**Título:** Analysis of the morphogenesis of the Central Nervous System in Drosophila

**Resumen de la Memoria:**

Responsiveness and adaptability characterize the living matter and directly depend on signal integration. At the cellular level, signaling pathways evolved to integrate intrinsic and extrinsic stimuli to promote tissue development and homeostasis. In a similar fashion, at the organism level, the Central Nervous System (CNS) integrates signals and modulates animal responses to serve survival and species propagation. How signal integration occurs during CNS morphogenesis and function has been a long-standing question of mine.

In this context, I initiated my scientific trajectory at BSRC "Alexander Fleming" in Greece, and defended my thesis titled "Functional analysis of DUSPs in Drosophila melanogaster" in 2013. Upon obtaining my PhD titled, I joined Dr. Martin-Blanco's laboratory at the IBMB (CSIC) to study the anatomical and physiological effects of JNK signaling in Drosophila CNS development. Two short appointments at the HHMI Janelia Research Campus (USA) and the MBI (Singapore) let me develop solid expertise on the ultrastructural characteristics of the CNS and on image acquisition and analysis techniques. The brain is a mechanically sensitive organ and its structure and functioning can be regulated by external and internal forces. Yet, the role of mechanical forces in mediating neuronal processes remains unexplored. Along this line, my postdoctoral research focused in 3 main questions:

1) How mechanics influences the final shape or size of an organ?

To answer this question I studied the condensation of the Drosophila embryonic Ventral Nerve Cord (VNC). This analysis revealed key issues: 1) condensation is bidirectional and occurs through oscillatory contractions; 2) coordinated mechanical interactions between neurons and glia implement condensation; and 3) a viscoelastic model of the process combines time delays and frictional interactions.

2) Which mechanisms dictate the architectural rules followed during CNS morphogenesis?

To do so I tackled the role of JNK signaling in the pioneer neurons of the Drosophila embryonic CNS. Pioneer neurons are early-born, providing guidance to follower neurons thus contributing to neuropile's axonal organization. I showed that controlled JNK activity in these neurons, early in embryogenesis, is a prerequisite for proper VNC architecture and condensation.

3) Which is the impact that nervous system architecture may have on its functionality?

I found that the levels of JNK activity in pioneers neurons are crucial for motor coordination maturation. Also, I showed that JNK autonomously regulates pioneer neurons' electrophysiological properties without affecting their synaptic vesicle transport.

My research has given insight into how developmental signaling imposes dynamic structural requirements on the CNS to achieve optimal functionality, proposing structure as a novel integration component. I believe in its high conceptual value as it provides evidence for VNC structure directly affecting its function.

In the proposal I present I switch to a cell-oriented approach. A first set of objectives, stemming from my recent studies, focuses in cell-cell and cell-matrix interactions not previously analyzed. Medium-term and long-term goals summarize functional analyses to be developed, such as motor activities and larval locomotion as well as studies of sensorial modulation, linked to structural integration.

**Resumen del Currículum Vitae:**

I have a Biology Bachelor obtained in 2004 from the University of Athens (Greece). After my graduation, I undertook my doctoral project on the "Functional analysis of Dual Specificity Phosphatases (DUSPs) in Drosophila melanogaster" at the BSRC "Alexander Fleming" in Athens, under the supervision of Dr. G. Panayotou and Dr. E. Skoulakis. The key objective of this work was to evaluate the role of JNK signaling and its negative regulator Puckered (Puc), a Drosophila DUSP, in Central Nervous System (CNS) development. In addition, I explored aspects of Puc post-translational regulation that led to the identification of the JNK-dependent phosphorylation of the phosphatase, under oxidative stress conditions (Karkali and Panayotou, Biochem Biophys Res Commun. 2012).

During my doctorate training and by attaining competitive funds from European agencies (EMBO, FEBS and European Science Foundation, Boehringer Ingelheim Fonds and Company of Biologist short term fellowships) I realized several stays in the laboratory of Dr. Martin Blanco, at the Institute of Molecular Biology of Barcelona (CSIC) with whom I established a solid collaboration. My efforts in his lab focused on Puc's transcriptional regulation resulting in the identification of intronic cryptic tissue-specific enhancers of the gene (Karkali and Martin-Blanco, Int J Mol Sci, 2021).

Upon obtaining my PhD title from the University of Athens (Greece) in 2013, I joined Dr. Martin Blanco's laboratory as a postdoc to carry on with the study of the anatomical and physiological effects of JNK signaling in Drosophila CNS development. During my post-doctoral research, I completed two short-appointments. First, I joined forces with an international team directed by Dr. A. Cardona in the HHMI Janelia Research Centre (USA), participating in the Drosophila larva CNS connectome project. Next, I joined the laboratory of Dr. T. Saunders in the Mechanobiology Institute of National University of Singapore (Singapore), in order to perform light sheet microscopy and to develop image processing tools. The vast amount of the work developed in Dr. Martin-Blanco's laboratory was devoted to Ventral Nerve Cord (VNC) condensation biomechanics, from structural to functional analysis. These studies resulted in 6 additional papers as a first author, in two of which I share correspondence (*) (Karkali and Martin-Blanco, Int J Mol Sci, 2021; Karkali et al, Dev Cell, 2022; Karkali et al, STAR Protocols *, 2022; Karkali et al, Nat Commun, 2023 a; Karkali et al, Nat Commun, 2023 b*; Karkali et al, Front Cell Dev Biol, 2024). Two commissioned Reviews were also published during this time (Rebollo et al, Methods, 2014; Karkali et al, Sem Cell and Dev Biol, 2017).

In my career I have made a total of 10 publications and 2 technical reports, and I have attended nine national and international conferences with oral/written presentations. As a member of Dr. Martin Blanco's laboratory, I have participated in five Research projects granted by the Spanish government as a "Work Team Member" and I have independently submitted a research plan as principal investigator (JIN 2019). In terms of mentoring I have been the tutor / co-supervisor of 6 alumni of the University of Barcelona.

Currently, I am a post-doctoral researcher in the laboratory of Dr. V. Ruprecht at the Centre for Genomic Regulation (CRG-Barcelona, Spain) (January 2024).

**Área Temática:** Biociencias y biotecnología
**Nombre:** ROS TORRES, ORIOL
**Referencia:** RYC2023-045736-I
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**Título:** Mecanismos Celulares Responsables de Guía axonal: Vías de señalización y organización de efectores celulares.

## Resumen de la Memoria:

I am an Early Stage Researcher, returned to Spain after a postdoc stay in Paris, with a Beatriu de Pinós/Marie Sklodowska Curie Actions COFUND fellowship in the University of Barcelona (UB). My research career focuses on the mechanisms driving axon growth during development and the cell biology of the growth cone.

My PhD, directed by E. Soriano and T. Cotrufo, used novel approaches and imaging techniques to shed new light on the role of exocytosis and membrane dynamics during axon guidance. First, I participated in the description of a signaling cascade linking Netrin-1 attraction with calcium-mediated exocytosis. My work allowed visualizing at high resolution that Netrin-1 binding to its receptor DCC induces the interaction between DCC and Syntaxin-1, component of the SNARE complex, in growth cones. This recruits TI-VAMP, forming an atypical SNARE complex that triggers exocytosis. A second group of experiments I carried out in E. Stoeckli's lab in Zurich, showed that interfering with SNARE function in chick embryos induced guidance errors of commissural and motor neurons in vivo. Parallel studies in mouse and fly demonstrated that SNARE function is required for correct axon navigation in a wide range of organisms and this mechanism is conserved through evolution. Finally, I developed a method to study membrane dynamics and exocytosis in growth cones using an advanced live imaging setup. With this method, I described that growth cones have complex membrane dynamics that alternate periods of high exocytosis and periods of calm. I was also able to describe how the attractive molecule Netrin-1 does not alter these intrinsic patterns of exocytosis, but rather exacerbates them by increasing their frequency.

For my postdoc I joined the team of X. Nicol in the Vision Institute of Paris, aiming to understand the signaling mechanisms behind axon guidance. There I have described a code of second messenger signals based in local differences on plasma membrane composition: Local modulation of cAMP in lipid rafts is required for the refinement of retinal projections in the superior colliculus and the formation of retinotopic maps. I also developed SponGee and SpiCee, molecular buffers of cGMP and calcium with cellular specificity and subcellular resolution which are being patented.

I am currently a Beatriu de Pinós fellow. My research career started way before the end of my BSc studying development, cell signaling and cancer, with research stays in labs in Czech Republic, Manchester (UK) and Barcelona, before focusing on the cellular mechanisms driving nervous system connectivity for my PhD and PostDoc. I have published 10 original research articles and 1 invited commentary article in Q1 international research journals, with 239 citations (Google Scholar, h-index: 9). Throughout my career I have mentored several Master/PhD students. Recently, I have participated as an evaluator for the Martí-Franques COFUND Fellowship (Universitat Rovira i Virgili, URV), and been invited to give lectures in the Master of Neuroscience (UB, University Pompeu Fabra, University of Lleida and URV). I am an accredited Lecturer (AQU, 2019). I am the Project Leader on a consortium between UB and Mass Eye and institute (Harvard University) in a research proposal.

## Resumen del Currículum Vitae:

I am an Early Stage Researcher, returned to Spain after a postdoc stay in Paris, with a Beatriu de Pinós/Marie Sklodowska Curie Actions COFUND fellowship in the University of Barcelona (UB). My resrach career focuses on the mechanisms driving axon growth during development and the cell biology of the growth cone.

My PhD, directed by E. Soriano and T. Cotrufo, used novel approaches and imaging techniques to shed new light on the role of exocytosis and membrane dynamics during axon guidance. First, I participated in the description of a signaling cascade linking Netrin-1 attraction with calcium-mediated exocytosis. My work allowed visualizing at high resolution that Netrin-1 binding to its receptor DCC induces the interaction between DCC and Syntaxin-1, component of the SNARE complex, in growth cones. This recruits TI-VAMP, forming an atypical SNARE complex that triggers exocytosis. A second group of experiments I carried out in E. Stoeckli's lab in Zurich, showed that interfering with SNARE function in chick embryos induced guidance errors of commissural and motor neurons in vivo. Parallel studies in mouse and fly demonstrated that SNARE function is required for correct axon navigation in a wide range of organisms and this mechanism is conserved through evolution. Finally, I developed a method to study membrane dynamics and exocytosis in growth cones using an advanced live imaging setup. With this method, I described that growth cones have complex membrane dynamics that alternate periods of high exocytosis and periods of calm. I was also able to describe how the attractive molecule Netrin-1 does not alter these intrinsic patterns of exocytosis, but rather exhacerbates them by increasing their frequency.

For my postdoc I joined the team of X. Nicol in the Vision Institute of Paris, aiming to understand the signaling mechanisms behind axon guidance. There I have described a code of second messenger signals based in local differences on plasma membrane composition: Local modulation of cAMP in lipid rafts is required for the refinement of retinal projections in the superior colliculus and the formation of retinotopic maps. I also developed SponGee and SpiCee, molecular buffers of cGMP and calcium with cellular specificity and subcellular resolution which are being patented. This postdoc experience allowed me to develop some of the tools that will be key in the development of the present proposal, and have first hand experience with lipid raft physiology in nervous system connectivity. Together with the advanced imaging techniques I developed during my PhD, it ensures the correct development of the present research proposal.

I am currently a Beatriu de Pinós fellow. My research career started way before the end of my BSc studying development, cell signaling and cancer, with research stays in labs in Czech Republic, Manchester (UK) and Barcelona, before focusing on the cellular mechanisms driving nervous system connectivity for my PhD and PostDoc. I have published 12 original research articles and 2 review/commentary article in Q1 international research journals, with 291 citations (Google Scholar, h-index: 9). Throughout my career I have mentored several Master/PhD students. Recently, I have participated as an evaluator for the Martí-Franques COFUND Fellowship (Universitat Rovira i Virgili, URV), and been invited to give a lecture in the Master of Neuroscience (UB).

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| **Área Temática:** | Biociencias y biotecnología |
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| **Título:** | Molecular regulation of chloroplast development |

**Resumen de la Memoria:**

As a scientist, my goal is to answer a basic question in plant biology: how plants develop and adapt in continuously changing environments? Throughout my career, I have successfully investigated this problem, describing molecular mechanisms in plant development and acclimation to environmental challenges, in different national and international institutions.

During my PhD studies in Prof. Salinas' laboratory (INIA and CIB, Spain) I led the project to characterise the LSM nuclear complex, a core component of the spliceosome, in Arabidopsis. The results from this period are the first report of the molecular function -splicing and RNA decay- of the LSM proteins in plants. We described LSMs role in development, and the involvement of the nuclear LSM complex, in the different regulation of cold acclimation and tolerance to salt by controlling the splicing of specific transcripts. The significance of these results was reflected in two publications, as shared-first author (Plant Cell; NAR) and a review (Front Plant Sci). Before defending my PhD, I joined Prof. Allona's group (CBGP, Spain) to work in phenology of woody plants, in a project to characterise chestnut RAV1. We described the role of CsRAV1 in the development of sylleptic branches in poplar, and its biotechnological potential for biomass production in a field trial. Moreover, I described the functional divergence of CsRAV1 in Arabidopsis. The results of this work were reflected in three publications (New Phyt; Biotechnol Biofuels, Front Plant Sci).

Realising the importance of chloroplasts as sensors and in responses to stress, I joined Prof. Strand's group (UPSC, Sweden) as leading researcher of the project on plastid transcription and retrograde signalling during chloroplast biogenesis. I was main contributor to the identification of the first mechanism of redox regulation of plastid transcription during chloroplast biogenesis. I led the work on retrograde signals, describing the role of GUN1 retrograde signal in dark-grown plastids and early developing chloroplast, repressing nuclear gene expression to protect the seedlings. The relevance of these results is reflected in one publication as co-corresponding, and three as first or shared-first author (Nat Commun; Plant Phys; Physiol Plant; New Phyt).

Currently, I am leading the C2 photosynthesis engineering project in Dr. Lundgren's group (Lancaster University, UK). I have authored a review as corresponding author (Plants People Planet), and we are preparing the first results of the project for publication.

In the course of my career, I have been invited as a speaker in seminars and as external evaluator of a PhD. I have created and successfully co-supervised Master student projects. I have applied for funding and fellowships, and contributed to the community by peer-reviewing, organising seminar series and outreach activities.

The Ramon y Cajal will be the springboard to establish myself as an independent scientist to develop cutting-edge research on the molecular mechanisms underlaying chloroplast development and their role in plant growth and acclimation. The research line is innovative, timely and relevant for the scientific community and the society, as it has the potential to generate biotechnological tools to enhance crop resilience and productivity.

**Resumen del Currículum Vitae:**

I am an experienced researcher, with a successful trajectory working in abiotic stress, responses to environmental changes and chloroplast biogenesis in several elite research institutions within Europe.

I studied Biology at Universidad Complutense de Madrid (UCM, Spain). Before graduating I obtained a Collaboration Fellowship to work with Prof. Vázquez Lomo in plant somaclonal variation (Department of Genetics, UCM, Spain, 2001-2002). After graduating in 2002, I joined Prof. Salinas' group (INIA, Spain, 2003) with an INIA Predoctoral Fellowship to work on molecular mechanisms of plant tolerance to abiotic stresses. During my PhD, we did pioneering research describing the LSM proteins in Arabidopsis, and their role in the regulation of development and stress tolerance. Before my thesis defense I joined Prof. Allona's group (2011, CBGP, Spain) to study winter dormancy and phenology in woody plants. We described the role of RAV1 transcription factors in sylleptic branching, and their potential to increase biomass. The results of this period as PhD candidate are 6 publications, 2 as shared-first author, in high impact general biology (NAR) and plant journals (Plant Cell, New Phyt., Front. Plant Sci.).

After my PhD defense (UCM, Spain, 2014), I was invited to present my work in the "UPSC Symposium for Young Plant Scientists" (Sweden), and I decided to join Prof. Strand's group (UPSC, Sweden, 2015) as postdoctoral researcher to lead research nucleus and plastid coordination during chloroplast biogenesis. Our work described the first mechanism of redox regulation of plastid transcription during chloroplast biogenesis in light, and a plastid retrograde signal present in plastids before the onset of chloroplast development that represses nuclear gene expression. Currently I work in Dr Lundgren¿s laboratory (2021, Lancaster University, UK) leading the C2 photosynthesis engineering project. As a postdoctoral researcher I have published 2 research articles and 3 reviews, as first, shared-first, or corresponding author in high impact general biology (Nat. Comm.) and plant science journals (New Phyt.; Plant Phys.; Phisiol. Plant.; Plants People Planet).

During my career, I have successfully participated in 6 national and international research projects. Since 2012, I have published 11 research and review articles, including one as corresponding and one as co-corresponding author. I have presented my work in invited seminars, and national and international conferences (Plastid Preview, CBGP Seminar Series, SPPS, RBMP, Congresso Luso-Espanhol de Fisiologia Vegetal). I have experience supervising and mentoring Master's Degree projects (UPSC and Lancaster University), and teaching laboratory classes (CBGP-UPM, Spain). Besides, I peer-review manuscripts for plant science journals included in the JCI (e.g. Plant J.; New Phyt.; Plant Phys.; Phisiol. Plant.), I am member of scientific societies (Sociedad Española de Biologia de Plantas, Federation of European Societies of Plant Biology since 2013), and I am organizing departmental seminars and outreach activities (Fascination of Plants Day, and Light up Lancaster).

In summary, the quality of my research trajectory is illustrated by my successful participation in different projects across several institutions, and by my publication record in high-impact general biology and plant science journals.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Biociencias y biotecnología
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**Título:** Nucleic acids structures: targets and therapeutic agents

**Resumen de la Memoria:**

In 2008, I graduated in Chemistry by the University of Salamanca (Spain). Shortly after getting my degree I had the opportunity to do an internship in Prof. Joel Lemaire' s group at the University of Paris Sud 11 (Paris, France) where I got training on FTICR mass spectrometry of small organic compounds. Few months later, I was granted with an FPI fellowship to carry out a PhD co-supervised by Prof. Alfredo Villasante (CBMSO-CSIC-UAM) and Prof. Carlos González (IQF-CSIC), both in Madrid (Spain). As a PhD student, I got extensive expertise on NMR spectroscopy and other biophysical techniques that I applied to investigate on the structure of DNA and RNA sequences found in specialized regions of the chromosome such as telomeres and centromeres. Thus, by using NMR and optical tweezers, I was able to determine particular structural aspects of long telomeric RNA (TERRA) molecules. Also during my PhD, I successfully implemented a 19F-NMR methodology to screen for ligands for TERRA. Finally, I determined by NMR, the high-resolution structure of centromeric DNA sequences forming i-motif structures. As a PhD candidate, I enjoyed internships in very prestigious foreign laboratories in the field of nucleic acids structures such as Prof. Stephen Neidle' s laboratory (UCL, London, UK) and Prof. Valérie Gabelica' s group (IECB, Bordeaux, France), which are specialized in X-ray crystallography and mass spectrometry of nucleic acids, respectively.

After defending my PhD thesis, I joined the group of Dra. Olga Calvo where I studied, using S.cerevisiae as a model organism, the different roles of the transcription factor Sub1 along transcription process. In 2017, I joined back the IQF NMR group and, shortly after, I was granted with a Juan de la Cierva fellowship. In this period, I got training on NMR structural determination of chemically-modified nucleic acids and I addressed questions regarding non-canonical nucleic acids structures in cell. In 2018, I was awarded with a Marie Sklodowska Curie fellowship (MSCA) which entailed two years at McGill University (Montreal, Canada) and one year at IQF-CSIC (Madrid, Spain). The MSCA action focused on the development of therapeutic tools based on antisense therapy and RNA ligands to treat Amyotrophic Lateral Sclerosis (ALS). In 2022, I was granted with a fellowship launched and funded by CSIC to extend the MSCA duration for 18 months. The proposal entails the consolidation of the research lines developed along the MSCA fellow.

My main research interest is the structure and function of nucleic acids, biomolecules that can be both targets and therapeutic agents for treating a plethora of diseases. In particular, my research lines are focused on non-canonical structures of nucleic acids involved in fundamental phenomena occurring in the cell context. Specifically, I aim to apply and develop novel structural approaches to determine, with high resolution, the structural features of RNA-RNA and RNA-protein complexes responsible of aggregation and phase separation occurring in membraneless organells and neurodegenerative diseases. Additionally, I aim to screen, design and test binders of RNA able to modulate disease-associate LLPS.

**Resumen del Currículum Vitae:**

In 2009, I was granted with an FPI fellowship to carry out a PhD at CBMSO-CSIC-UAM and IQF-CSIC, both in Madrid (Spain).

As a PhD student, I got extensive expertise on NMR and other biophysical techniques that I applied to investigate on the structure of DNA and RNA sequences found in telomeres and centromeres. I learnt and developed the procedures to prepare telomeric RNA (TERRA) molecules which were characterized by bulk and single molecule methods. Results from this work were published in two scientific articles, one as first author and one as second author published during my postdoctoral stage at the IQF-CSIC.

Also in this period, I developed a 19F-NMR-based methodology to screen for ligands for long TERRA molecules. This work showed a new and advantageous method to search for selective ligands of nucleic acids which attracted the interest of pharma and relevant groups in the field.

Another focus of my investigations was the centromeric DNA. I applied NMR to determine that human and D. melanogaster centromeric DNA sequences can fold into i-motif structures. These investigations were published in two scientific papers and a dissemination article in Atlas of Science. During my PhD, I enjoyed internships in very prestigious foreign laboratories such as Prof. Stephen Neidle' s laboratory (UCL, United Kingdom) and Prof. Valérie Gabelica' s group (IECB, France), worldwide renown laboratories in the study of nucleic acids structure through X-ray crystallography and mass spectrometry, respectively. Additionally, along my PhD, I actively participated in national and international specialized meetings where I shared my results.

After defending my PhD thesis, I joined the group of Dra. Olga Calvo (IBFG-CSIC-USAL, Salamanca, Spain) where I studied the different roles of the proteins Sub1 and Rpb4/7 along the transcription process. Some of the results obtained during this period were publish in a high-impact journal.

In 2017, I was awarded a Juan de la Cierva Fellowship (JdC) that I enjoyed at IQF-CSIC. I focused my research on non-canonical structures of chemically-modified nucleic acids. This allowed me to initiate fruitful collaborations with the groups of Prof. Filichev (Massey University, New Zealand) and Prof. Damha (McGill University, Canada). Results from these research lines have been recently published in the high-impact journal Nucleic Acids Research. During this period, I also published a review on the i-motif structure having now more than 300 cites. I also participated in the study of the interaction of TERRA and HP1a, a protein involved in heterochromatin maintenance.

Before finishing the JdC, I was awarded the very prestigious Marie Curie postdoctoral fellowship. My proposal of developing nucleic acid-based therapies for Amyotrophic Lateral Sclerosis (ALS) was ranked first in the Chemistry panel. I conducted and led the project at McGill University and at IQF-CSIC. During this period, I published three scientific articles, one of them as a corresponding author. Other contributions during this period were the publication of a book chapter and a review article.

In 2022, I was granted with a fellowship launched and funded by CSIC to extend the MSCA-IF duration for 18 months. The proposal entails the consolidation of the research lines developed along the MSCA-IF fellow and opening new lines at the forefront of fundamental science.

**Resumen de la Memoria:**

I am a biophysicist with broad experience (>14 years) in using single molecule bionanophotonics to address fundamental biological questions such as cancer immunotherapy, liquid-liquid phase separation and viral infections. As such, I have developed recently a multi-color single molecule imaging technique (termed HiDenMaps) able to capture the initial events of viral capture by multiple co-receptors on the cell membrane of immature dendritic cells (imDCs). This technique opens up the possibility of being applicable in a wide range of biological processes where multi-component systems need to be characterized at the single molecule level with nanometer and milli-second spatial and temporal resolutions, respectively. In my proposal, I will get advantage of this technique with the aim of characterizing, to the best of my knowledge, for the first time the interaction between a single anti-HIV-1 broadly neutralizing VRC01 antibody (bNAb) and a single HIV-1 virus in the context of a CD4+-T cell infection by HIV-1. Importantly, I will assess the neutralization process by the bNAb VRC01 in three different experimental settings recapitulating the HIV-1 infection process in-vivo. The specific objectives of the proposal are:

Objective 1: Assesing the interaction between HIV-1 VLPs and the bNAb VRC01 in primary CD4+-T cells:

In this objective, I will characterize in real time, using multi-color HiDenMaps, the neutralization by VRC01 Abs of HIV-1 virus-like particles (VLPs) while interacting with CD4 and the co-receptors CXCR4 and CCR5 on the cell membrane of living T cells.

Objective 2: Assessing the interaction between surface-attached HIV-1 VLPs and the bNAb VRC01 in primary CD4+-T cells mimicking a virological synapse:

In the second objective, I will reproduce a virological synapse between an antigen presenting cell (APC) and a CD4+-T Cell using a reductionist approach. Indeed, I will attach HIV-1 VLPs on supported lipid bilayers mimicking the APC. I will then add the CD4+-T cell to the supported lipid bilayer using a microfluidic chamber thereby characterizing, using multi-color HiDenMaps, a virological synapse from an in-vitro experimental setting. Finally, I will add VRC01 Abs with the aim of assessing their neutralization capacity.

Objective 3: Assessing the interaction between HIV-1 VLPs and the bNAb VRC01 in a virological synapse formed by primary CD4+-T cells and mDCs

In the last objective, I will focus on reproducing a virological synapse between a living APC and a CD4+-T cell. Moreover, I will add VRC01 Abs with the objective of characterizing their neutralization into the context of the virological synapse. To characterize this process in real time, I will get advantage of 3D multi-color HiDenMaps.

The proposal is highly ambitious in pursuing the overarching goal of characterizing the neutralization of an individual anti-HIV-1 VRC01 bNAb and a HIV-1 virus in living CD4+-T cells. By using a recently developed multi-color single molecule imaging technique, I will be able to visualize this process with unprecedented spatial and temporal resolution. Importantly, the results of this proposal can have direct implications into the development of preclinical anti-HIV-1 vaccines and therapeutic strategies. As such, this proposal represents an unique translation from basic research into a preclinical vaccinology setting.

**Resumen del Currículum Vitae:**

I am a biophysicist specialized in quantitative single molecule sensitive fluorescence microscopy in living cells. As such, I have a broad experience of more than 14 years in tackling cell biology questions using advanced imaging approaches at international competitive research labs. Moreover, I have had the privilege of collaborating and working with renowned scientists coming from a high degree of multidisciplinary areas ranging from applied immunology, cell biology to theoretical modeling. This vast interdisciplinary environment has given me the unique opportunity of developing my research career at the frontier between Physics and Biology at an international competitive level. A prominent example is my PhD thesis. I developed my doctoral studies at the Institute of Photonic Sciences (ICFO) in Barcelona under the supervision of Prof. Maria Garcia-Parajo. During these years, I addressed the lateral behavior of the HIV membrane receptor DC-SIGN and of the antigen presenting protein CD1d using cutting-edge quantitative fluorescence microscopy. Indeed, by combining multiple-color Single Particle Tracking (SPT) and STED super-resolution microscopy, I aimed to tackle how these two transmembrane proteins are organized on the surface of antigen presenting cells. Moreover, I succeeded in connecting the spatiotemporal behavior of these two proteins with their biological function within the context of the human immune system.

As a postdoctoral scholar in the lab of Prof. Facundo Batista at the Ragon Institute of MGH, MIT and Harvard in Boston (U.S.A.) I applied my scientific background in single molecule analysis to study the B cell response of healthy donors at the single cell level in order to tackle the immunogenicity of HIV and Influenza based antigenic nanoparticles. As a senior postdoctoral scholar and back to Barcelona, I have had the privilege of coordinating 5 different research labs ranging from theory modeling, single molecule microscopy, chromatin organization and gene expression at CRG (Barcelona, Spain), ICFO (Barcelona, Spain) and IRB (Barcelona, Spain) in the emerging topic of liquid-liquid phase separation. Moreover, I have also developed another research line involving the characterization of early virus-receptor interaction by means of multi-color single molecule imaging. I have had also the opportunity of supervising Master and a PhD Students as a sign of leadership and independence. Indeed, I have published my first publication as a

co-corresponding author in the prestigious journal P.N.A.S. (Munoz-Gil et al., PNAS 2022) and I have another publication with me as last co-corresponding author under review in Nature Communications (Mateos et al., Biorxiv 2023).

Moreover, I have had the privilege of giving more than 10 invited talks in international prestigious scientific conferences and research centers such as the Annual Biophysical Society Meeting or the Francis Crick Institute. As for my scientific performance, I have 14 publications with more than 1200 citations and an H-index of 12 according to Google Scholar. Importantly, I have had a large number of prizes including ICFO and UPC PhD Thesis Award and several postdoc fellowships such as the HFSP, EMBO and Juan de la Cierva Incorporacion fellowships. Importantly and the highlight so far of my career, I was invited to attend the 68th Lindau Nobel Laureate Meeting in 2017 dedicated to Physiology and Medicine.

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| **Área Temática:** | Biociencias y biotecnología |
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| **Correo Electrónico:** | romeroro@mpi-cbg.de |
| **Título:** | Evolution of Early Proteins: Implications for the Design of a Synthetic Protocell |

**Resumen de la Memoria:**

Understanding how proteins originated and coevolved with the rest of the basic molecules of life represents a crucial yet unresolved puzzle in understanding life's beginnings. Previous research findings into protein evolution have noticed the frequent emergence of proteins by repeating sub-protein fragments. These observations suggest that first proteins arose by the self-assembly of a limited set of early and short peptides known as "starter peptides". The identity, biological role, and evolution of these starter peptides remain mainly unknown, which motivates the three fundamental questions that I will address in my future lab:

1- How can we identify the starter peptides?

Evolved versions of the starter peptides are commonly found as essential motifs in ancient proteins, traceable to the Last Universal Common Ancestor (LUCA), a theoretical ancient organism thought to be the common ancestor of all life on Earth. Thus, I propose to comprehensively analyse LUCA proteins to identify these key motifs, representing evolved versions of starter peptides.

2- What were the functions of the starter peptides?

It is hypothesized iron's key role as a prebiotic catalyst, supported by iron's ability to facilitate the abiotic synthesis of Krebs Cycle intermediates. I hypothesize that starter peptides exploited metal as coenzymes, hinting at rudimentary enzyme formation. Identifying an iron-binding starter peptide would validate this. Thus, building on my successful approach that identified the ancient phosphate-binding P-loop motif, I aim to identify an iron-binding starter peptide with enzymatic activity.

3- How did the microenvironment coevolve to support the function of starter peptides, leading to early cells?

In the early stages of life, starter peptides needed to interact with not only metals but also nucleic acids, nucleotides, and other vital organic materials. The formation of protocells required compartmentalization to hold these materials together. Alexander Oparin's 1920 proposal suggested that coacervate droplets, i.e., a liquid-liquid phase separation process of charged macromolecules, might have served as rudimentary compartments. The catalytic potential of starter peptides within coacervate-based protocells has not been demonstrated yet. To tackle this, I will investigate starter peptides' catalytic properties in a coacervate context and their interplay with iron and RNA catalytic molecules.

Combining biophysics, chemistry, structural and molecular biology, and artificial cell synthesis, I plan an interdisciplinary research program to investigate the origin of cellular catalysis through three aims:

1: Comprehensive organization and analysis of proteins putatively present in LUCA

2: Design a starter peptide able to bind iron and synthesise Krebs Cycles metabolites

3: Build a protocell model compatible with the function of phosphate- & iron-binding starter peptide

The outcome of this research will be a better understanding of the origins and evolution of proteins, their coevolution with essential molecules of life, and the potential role of coacervate droplets in the emergence of cellular life. Ultimately, this research has the potential to redefine our understanding of life's origin and contribute to applications in protein engineering.

**Resumen del Currículum Vitae:**

Before I obtained my Chemistry degree, I received a Research Initiation Scholarship and a Collaboration Fellowship, gaining initial research exposure. Collaborating with Cervezas Alhambra, I developed innovative chromatography methods for the food industry. I then enhanced mentoring skills through a Teaching Certificate.

For my Ph.D., I joined Sanchez-Ruiz's lab with a Ph.D. fellowship from the Andalusia Government (FPI was declined) to dig into fundamental evolutionary analysis of protein functionality and stability, and its application to protein design. My findings advanced our understanding of early life conditions and led to a general approach for stabilizing protein scaffolds. Concurrently, I lectured for 120 hours in Physical Chemistry Laboratory.

I conducted postdoctoral research at the Weizmann Institute of Science in Dan Tawfik's lab, initially funded by a Ramon Areces Postdoctoral Fellowship and later by a Koshland Foundation and McDonald-Leapman Grant Senior Postdoctoral Fellowship (declining a fellowship from the Andalusia Government). There, I focused on one of the most fundamental questions in biology: How did the first protein(s) arise? My work contributed to understanding the origins of functional proteins and showcased the first de novo design of an active protein. I secured a grant as a PI for an independent research line on protein assemblies' evolutionary and industrial potential. Additionally, I mentored two MSc students, coordinated an outreach activity with the Spanish embassy in Tel Aviv, and organized the German-Israeli Symposium "From So Simple a Beginning".

I joined Toth-Petroczy's at the Max Planck Institute of Molecular Cell Biology and Genetics, lab to establish the experimental research line of a previously computational-focused lab. My work centres on investigating protein synthesis inaccuracy. I identified a cross-talk between the environment and the biological flux of information that increases protein heterogeneity when organisms need adapt to new surroundings. I lead the wet lab, mentoring a team consisting of one technician, one Ph.D. student, two junior scientists, and one MSc student. Additionally, I have directed one Master's thesis.

Beyond the lab's primary research, I am actively developing my independent research line, applying my expertise in the origin of proteins for the design of a synthetic cell. Notably, I secured a Talent Attraction and Reintegration grant from the Community of Madrid (€337,500) and I have applied for the returning programme of the Ramon Areces Foundation (€1.250M, PRVP01S15796) and the ERC-2024 starting grant (CatalyticGenesis, €2M, 101163828).

In my career, I have published 17 papers in top journals (Nat. Commun., PNAS, Angew. Chem., EMBO Reports, PLOS ONE, Protein Science, Biophys Rev, etc), with corresponding authorship on five. I have presented at over 25 international conferences and seminars (Gordon Research Conference and Seminar, EMBO, Protein Society, etc), delivering 13 invited talks and three selected presentations. Recently I was invited to write an article for the

Annual Review of Cell and Developmental Biology. I serve as a reviewer for Molecular Biology and Evolution and collaborate with high-profile research groups.

Beyond my research, I have developed essential soft skills for effective research group management. My leadership, teaching, mentoring, and research experiences have shaped my ability to work independently and professionally mature.

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| **Área Temática:** | **Biociencias y biotecnología** |
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| **Título:** | Neural mechanisms for flexible innate behaviors |

**Resumen de la Memoria:**

My research career has focused on understanding the synaptic mechanisms underlying flexible and adaptive behavior, with a particular interest in innate behaviors.

I performed my doctoral work in the lab of Dr. De Zeeuw's at the Netherlands Institute for Neuroscience (NIN, Amsterdam). Here, I described a novel form of synaptic potentiation dependent on the AMPA receptor subunit 3 that occurs at cerebellar Purkinje cells, that does not require trafficking (as it is the case for the rest of AMPA subunits) but changes in single channel conductance and that is crucial for motor learning. These findings led to a first author publication in Neuron. Furthermore, in collaboration with the laboratory of Dr. Kessels (NIN), we found that this form of GluA3 dependent plasticity is also present in hippocampal synapses and it is caused by noradrenergic stimulation, characteristic of high arousal states. For this work, I published an article in eLife as a middle author. Moreover, I conducted a collaborative study with Roger Reeves (Johns Hopkins University) characterizing the oculomotor learning deficits present in a mouse model of Down Syndrome and possible therapeutic targets to ameliorate them. This work was published as first author in The Journal of Neuroscience. Altogether, my PhD work substantially contributed to the understanding of the neural mechanisms underlying the adaptation of innate oculomotor reflexes, a well-known form of cerebellar motor learning, in health and disease.

I conducted my first postdoctoral work in the laboratory of Dr. Zachary Mainen, at the Champalimaud Foundation (Lisboa). Here, I used a combination of optogenetic assisted circuit mapping, pathway specific genetic ablation and quantitative analysis of mouse behavior to establish a causal link between the maturation of prefrontal cortex input onto serotonergic neurons over adolescence to the development of behavioral persistence. These findings led to a preprint of which I am shared first author and that is currently accepted for publication in eLife.

In 2018, I joined an ERC funded project led by Dr. Susana Lima, for which I contributed exciting preliminary data supporting the core hypothesis to be tested during the grant. In the Lima lab I have focused on understanding how the synaptic configuration of hypothalamic circuits and their modulation by sex hormones provides a mechanistic explanation to the tight control between defensive and sexual behavior that occurs during the female reproductive cycle. My work describes a novel locus for the cyclical control of sexual rejection behavior, which until now was short of a neural substrate. These findings have led to a preprint, of which I am shared first author and that is currently under review in Neuron.

During the last 12 years of predoctoral and postdoctoral international experience, I have mastered an extended technical skillset (ranging from slice electrophysiology to in vivo optogenetics and deep neural networks assisted analysis of behavior) with the goal of producing excellent research of significant impact. Now, as an independent scientist I aim to apply my scientific knowledge to expand our understanding on the neural mechanisms underlying the integration contextual and internal state information for the flexible selection of innate behaviors.

**Resumen del Currículum Vitae:**

I performed my doctoral studies funded by a Marie Curie fellowship in the lab led by Dr. De Zeeuw's at the Netherlands Institute for Neuroscience. My doctoral work described a novel form of synaptic potentiation dependent on the AMPA receptor subunit 3 that occurs at cerebellar Purkinje cells, that does not require trafficking (as it is the case for the rest of AMPA subunits) but changes in single channel conductance and that is crucial for motor learning. These findings led to a first author publication in Neuron. Furthermore, in collaboration with the laboratory of Dr. Kessels (Netherlands Institute for Neuroscience), we found that this form of GluA3 dependent plasticity is also present in hippocampal synapses and it is caused by noradrenergic stimulation, characteristic of high arousal states. For this work, I published an article in eLife as a middle author. Moreover, I conducted a collaborative study with Roger Reeves (Johns Hopkins University) characterizing the motor learning deficits present in a mouse model of Down Syndrome and possible therapeutic targets to ameliorate them. This work was published as first author in The Journal of Neuroscience. For the work conducted during my PhD I received the Collaborative Excellence Brain Award of the Netherlands Institute for Neuroscience.

For my postdoctoral period, I sought to understand the role of synaptic modulation in the computations performed by anatomically defined neural pathways to originate behavior in the laboratory of Dr. Zachary Mainen, at the Champalimaud Foundation. Here, I used a combination of optogenetic assisted circuit mapping, pathway specific genetic ablation and quantitative analysis of mouse behavior to investigate the neural correlates of behavioral persistence development in mice. We found that the maturation of prefrontal cortex input onto serotonergic neurons in the dorsal raphe over adolescence is causally linked to the development of behavioral persistence. These findings led to a preprint publication of which I am shared first author and that is accepted for publication in eLife.

In 2018, I joined an ERC funded project led by Dr. Susana Lima, for which I contributed exciting preliminary data supporting the core hypothesis to be tested during the grant. In the Lima lab I have focused on understanding how the synaptic configuration of hypothalamic circuits and their modulation by sex hormones provides a mechanistic explanation to the tight control between defensive and sexual behavior that occurs during the female reproductive cycle. These findings led to a preprint publication, of which I am shared first author and that is currently under review in Neuron. Furthermore, I have co-supervised a Msc thesis project characterizing the morphological and electrophysiological properties of our hypothalamic neural population of interest and that has led to a shared first-authorship publication in eNeuro.

In collaboration with Dr. Lima, I have peer reviewed articles for Cell and Neuron. Furthermore, yearly since 2016, I have been a guest lecturer for the MSc of Neuroscience in Valencia (Spain) and in the International Neuroscience and Physiology PhD program at the Champalimaud Foundation, where I have been in charge of teaching the modules of synaptic physiology and synaptic plasticity.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | CASTELLANO POZO, MAIKEL |
| **Referencia:** | RYC2023-042817-I |
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| **Título:** | Genetic instability and changes in chromosome structure during mitosis and meiosis of eukaryotic model organisms |

**Resumen de la Memoria:**

Graduated with honours in Biology from the University of Seville (US), I obtained 3 fellowships (PFIS, JAE, FPU) to pursue a PhD in Aguilera & G-Muse's lab at USE/CABIMER. I studied the factors involved in genome stability related to transcription, and investigated the causes and consequences of replication stress and DNA repair defects. We revealed that THO, a component of messenger ribonucleoprotein particles, contributes to genome integrity during mitotic DNA replication in C. elegans (1st author PloS One). We found that R-loops, three-stranded structures formed during transcription from DNA:mRNA hybrids, can occur during meiosis leading to infertility by disrupting replication and genome stability (1st author EMBO reports). We uncovered the mechanism behind genome instability caused by R-loops in S. cerevisiae, C. elegans, and human cells linked to H3 S10 phosphorylation during meiosis/mitosis, a mark of chromatin condensation. H3S10P accumulation in active ORFs was related to R-loops, leading to replication fork defects by chromatin condensation (1st author Molecular Cell).

Awarded 2 prestigious postdoc fellowships, FAME and European EMBO, I moved to MRC-Imperial College of London in Martínez-Pérez's lab to expand my expertise in cohesin complexes (REC-8 and COH-3/4) and their role in chromosome dynamics during meiosis. Cohesin plays a role in genome stability maintaining sister chromatid cohesion (SCC), assembling the synaptonemal complex (SC), and facilitating DNA repair. By setting up a TEV system to fast degrade cohesin, we found a new role for cohesin as a regulator of early meiotic progression: nuclei with fully assembled SC could revert to early prophase events, including chromosome movement and SPO-11-dependent DSB formation, revealing unexpected plasticity in the meiotic program (1st author Nature Communications). We found that role of meiotic cohesin is complex-specific and dependent on its dynamic. Stable REC-8 provided SCC and DNA repair, while COH-3/4 regulated chromosome structure, associating dynamically with pachytene chromosomes (1st author eLife). Also, we are preparing a paper (1st author) describing the maintenance of genome integrity in undifferentiated germ cells by SCC-1. I promoted 2 collaborations that elucidate how aminopeptidase APP-1 prevents replication-associated genome instability, and how WAPL-1 is conserved in meiosis and regulates chromosome structure antagonizing COH-3/4 (Plos Genetics & eLife). I supervised a PhD and a Master's students' thesis, which investigated mechanisms of cohesin function in the C.elegans germline.

In early 2021, I moved to US/CABIMER in Huertas' lab, an expert in DNA damage and repair, awarded with recognized European Marie Curie Individual Fellowship. The basis of this project came from my observations during previous postdoc and describes how meiotic REC-8 cohesin is essential for genome stability in C. elegans¿ undifferentiated germ cells. Project has been successfully developed, allowing me to establish my niche in a poorly studied field. I promoted a collaboration that describes how DNA end resection and homologous recombination is controlled by the intrinsic circadian clock (under revision, Nature). I wrote a review about chromosomal instability in genome evolution (corresponding author, Biology). I supervised 7 students' end-of-degree projects. I am teaching at US.

**Resumen del Currículum Vitae:**

I graduated with honours in Biology from the University of Seville (US) in 2007. From the start, my career goal has been to lead my own research group to understand the mechanisms preventing genomic instability, my area of interest. I received 3 fellowships (PFIS, JAE, FPU) to complete my PhD at the USE under the supervision of Aguilera and García-Muse, leaders in the field. During my PhD, I developed the technical skills and expertise necessary to become an independent leader in genomic instability, using 3 model organisms and setting up C.elegans model in the institute. As result, 3 first-author papers in high impact journals (PLoS One, EMBO Reports, Molecular Cell) from my PhD, which was rated cum laude. Highlight the Mol Cell paper, which continues having a high impact in the field. It was awarded several prizes, recognized with a Preview, and established the basis for new research lines in the host lab.

I have consistently sought funding for my subsistence and career advancement. I was awarded with 2 prestigious postdoc fellowships, the European EMBO and FAME, proving my level of competence. To expand my expertise in C.elegans and chromosome biology, I moved for 6 years at the highly recognized Imperial College of London under Martínez-Pérez's direction, where I joined the researcher team in the UKRI international research project. I expanded my technical and experimental skills but also sharpened my leadership skills by starting projects from scratch and collaborating with other leaders in the field. As result, 2 first-author paper in Nature Communications and eLife were published, and 2 collaborations papers (eLife, PLoS Genetics). A first-author paper is currently under construction. Improving my leadership skills, I was honoured to supervised a Master and a PhD student, both getting maximum qualifications. I acted on the Postdoc Committee at institute. My postdoc work was recognised with 2 MRC recognition awards.

Conducting postdoc research, I found unexpected results pointing to a new role for a meiosis-specific cohesin in genome stability of mitotic undifferentiated germ cells, allowing me to establish my niche in this under-studied field. These results let me to developed a research project and received the prestigious European Marie Curie Individual Fellowship, and moving to Huertas' lab at US, a leader in DNA damage and repair. While managing the European project as principal investigator, I was successful in establishing the C.elegans model in Huertas' lab and the MSCA project, which will release 2 publications at the end of 2024. Moreover, a collaboration paper is under revision at Nature, and I published a review paper as corresponding author. Additionally, I have supervised 4 undergraduate students, and another 3 are in progress. I also served on the Thesis Committee for final degree projects in 2021/22. Crucially, I have been involved in the research team of 19 projects and have attended 23 national/international genetic instability conferences, sharpening my outreach skills. I have served on the Scientific Committee at RSEQ National Symposium and acted as reviewer for the NAR journal. I am also a member of the Reviewer Board for the IJMS journal. I have also been active in dissemination activities such as the European Researcher's Night and organizing the SEBBM Webinar series. Besides, I am teaching at US.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | MONGIARDINO KOCH, NICOLÁS |
| **Referencia:** | RYC2023-043814-I |
| **Correo Electrónico:** | nmongiardinokoch@ucsd.edu |
| **Título:** | Phylogenomic paleobiology: computational developments at the interphase of genomic and paleontological sciences and their application to the study of the evolutionary history of echinoids (and other echinoderms) |

**Resumen de la Memoria:**

My research has focused on illuminating the phylogeny of sea urchins, achieved through the generation of the first phylogenomic datasets for the clade (reliant on novel genomes and transcriptomes: Mongiardino Koch et al. 2018 BMC Evol Biol; 2022 eLife), and their combination with paleontological information (Mongiardino Koch & Thompson 2021 Syst Biol). I have also extended these efforts to other echinoderm clades (sea cucumbers: Mongiardino Koch et al. 2023 Proc B; crinoids: Guensburg et al. 2023 J Paleontol), as well as developed more cost-efficient methods of high-throughput sequencing (targeted capture, genome skimming). This works relies on specimens sampled through deep sea research cruises as well as historical museum samples, combining state-of-the-art museomic approaches with the discovery of undescribed biodiversity. In turn, I use the inferred phylogenies to explore the determinants of macroevolution, employing phenomic methods for the automated acquisition of morphological data (e.g., Mongiardino Koch 2021 Evolution).

Furthermore, I develop simulation frameworks to explore the effects of paleontological data on our ability to reconstruct phylogenetic trees and divergence times (Mongiardino Koch & Parry 2020 Syst Biol; Mongiardino Koch et al. 2021 Proc B; 2023 Palaeontology), with the goal of promoting best-practices for the inference of evolutionary processes. I also develop and maintain computational tools that provide principled ways for maximizing the usefulness of genomic resources. I have introduced novel approaches to subsampling phylogenomic datasets (genesortR; Mongiardino Koch 2021 Mol Biol Evol), as well as new tools to quantify the impact of methodological choices on estimates of divergence times (chronospace). These methods are implemented in R, the most widely-used programming language among biologists, helping remove computational barriers and democratize genome-scale research.

My long term research objectives include: 1) Contribute to the development of the field of phylogenomic paleobiology, boosting phylogenetic and evolutionary research through the explicit combination of genomes and fossils; and 2) Developing echinoids as a model group with which to tackle macroevolutionary questions. These research programs will focus on developing novel bioinformatic tools that ease the use of genome-scale datasets by reducing computational barriers, testing the effect of paleontological data on our ability to reconstruct the past, and exploring the phylogenetic and macroevolutionary history of echinoids (sea urchins, heart urchins, and sand dollars) by explicitly combining phylogenomic and paleontological information.

**Resumen del Currículum Vitae:**

I graduated from Yale University with a PhD in Earth & Planetary Sciences in 2021, done under the supervision of Dr. Derek Briggs, and have since joined UC San Diego as a Postdoctoral Fellow, working with Dr. Greg Rouse. I am a leader in the field of phylogenetic paleobiology, striving to advance the integration of molecular and paleontological data for the inference of phylogenetic relationships and macroevolutionary history.

I have coauthored 30 peer-reviewed publications (16 as first + 3 as sole author + 3 as last author), including work published in prestigious journals (Nature Ecology & Evolution, Current Biology, Proceedings B, eLife) and recognized through several prizes (2020 Publisher's Award for Excellence in Systematic Research, 2017 George Gaylord Simpson Prize). 80% of this research output does not include my PhD or postdoctoral advisors, proof that I have established myself as a well-connected and independent researcher. According to Google Scholar, I count with 793 citations and an h-index of 17. I have coauthored 56 conference presentations (25 as presenter, including 2 invited talks and 1 keynote), and have given 15 departmental seminars, showing that my research is well-regarded among peers. Throughout, I have funded my studies through the acquisition of numerous highly-competitive scholarships, including a Fulbright grant that allowed me to relocate to the US, as well as conceived and wrote the NSF grant that supports my current postdoc. I have also reviewed for over 20 scientific journals, and serve as editor of the World Echinoidea Database.

I am equally passionate about mentorship and teaching, having mentored several PhD and MS students on the topics of phylogenetics, evolution, and bioinformatics, and amassed a wealth of teaching experience (10 semesters as teaching assistant, main instructor on an online course). Recently, I have been appointed Lecturer at UC San Diego, being instructor of record of the graduate-level course "Introduction to Programming with R", a class I developed and taught in 2023 (scheduled again for 2024). The course, as well as myself as an instructor, were evaluated as "excellent" by 88% of students.

**Área Temática:** Biociencias y biotecnología
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**Título:** CELLULAR CROSSTALK IN HOMEOSTASIS AND DISEASE

**Resumen de la Memoria:**

For many years, cancer biology research has been focused on understanding cell-intrinsic characteristics of tumoral cells. This led to the identification of oncogenic mutations, cancer cell markers, tumoral cells metabolism, with the ultimate goal being to find Achilles' heel of cancer cells and stop their growth and spread. This body of research is pivotal to understand how a tumoral cell functions. However, tumor cells do not exist as isolated compartments. In fact, tumors develop in the milieu of a specific tissue and in the context of a whole organism, interacting with the surrounding cells and responding to hormones and molecules circulating in the blood stream and produced by distal organs. Thus, what is the role of the tumoral niche in cancer development? Which specific crosstalk is established between tumoral cells and stromal cells? How do molecules produced by distal organs can affect the tumoral growth? Which role do stromal cells play in metastasis organotropism? And finally, can we therapeutically intervene in this crosstalk to stop tumor proliferation and dissemination?

I have been working towards these biological questions for the last decade, by accumulating a variety of relevant scientific expertise and technical skills. I have a solid background in cellular and cancer biology, combined with a strong interest in cellular crosstalk in the tumor setting in vivo, in the mouse. My long-term plan is to define how mesenchymal cells participate in cancer development, in order to understand how cancer therapy could be improved, avoiding drug resistance as well as the formation of tumor metastasis. To achieve this goal, building up on my doctoral and postdoctoral works, I will establish three lines of research. Aim1 focuses on understanding the role played by mesenchymal cells in the tumoral niche. Based on my background, I will focus on intestinal cancer. Aim 2 aims to dissect the role played by pre-adipocytes in the long-distance crosstalk between adipose tissue and liver and its influence on cancer development. Aim 3 explores how mesenchymal cells determine metastatic organotropism. See Future research plans for a detailed description of these projects.

In the last decade, the stem cell microenvironment and, in particular, the mesenchymal fibroblasts that surround epithelial stem cells, are getting growing attention, especially with the advent of innovative technologies such as single-cell RNA sequencing and spatial transcriptomics. Studies in different organs highlighted the importance of mesenchymal components in tissue homeostasis and in pathological setting. Pdgfra-expressing fibroblasts have been described as mesenchymal component of almost every organ, and our results using the PdgfraH2BeGFP mouse nicely illustrate the heterogeneity and their contribution to organ homeostasis. However, how mesenchymal cells contribute to cancer development in different organs is still poorly understood. My future research focuses on mesenchymal fibroblasts role in cancer development and metastasis: in Aim 1, I investigate the role of local mesenchymal fibroblasts in intestinal cancer development. Aim 2 focuses on distal mesenchymal cells to dissect inter-organ crosstalk between adipose tissue and liver during cancer development. Aim 3 will decode molecular cues of metastasis and explore the mesenchymal basis of metastatic organotropism.

**Resumen del Currículum Vitae:**

I developed my interest in cellular crosstalk during my PhD, under the supervision of Dr. Guadalupe Sabio at CNIC in Madrid, Spain. My goal was to elucidate the signaling and cellular communication that underlie liver cancer development at the organismal level. I focused on the crosstalk between adipose tissue and liver during hepatocellular carcinoma (HCC) development. HCC incidence correlates with obesity and shows a marked gender disparity. I used different mouse models to study the cross-organ communication between adipose tissue and liver in HCC development. First, I demonstrated that adiponectin, a molecule secreted by the adipose tissue and more abundant in women, protects against tumor development, and explains HCC gender imbalance (see Manieri et al., JEM 2019). Next, I found that long-term inhibition of the stress-activated kinases JNK1/2 in hepatocytes alters the metabolism of bile acids, which triggers ERK activation and proliferation in cholangiocytes, promoting cholangiocarcinoma development (see Manieri et al., PNAS 2020). Furthermore, Dr. Sabio lab is a highly collaborative environment, and I had the possibility to actively contribute to other projects. These include the dissection of p38$\gamma$ in liver cancer development (see Tomás-Loba et al., Nature 2019, second author) and the involvement of p38 signaling pathway in LPS-induced liver damage (see González-Terán et al., JCI 2013, third author). I also contributed developing two mouse models to conditionally knock-out p38 activators, MKK3 and MKK6, that are still used in the lab (see Matesanz et al., Nature Communications 2017; Romero-Becerra et al. eLife 2022). Finally, my expertise in stress-activated kinases and metabolism is summarized in a review I wrote together with Dr. Sabio (see Manieri and Sabio, J. Mol. Endocrinol. 2015).

To explore a different biological system (the gastrointestinal tract), and to acquire new expertise (modern genomics, imaging, and organoid technology) I moved to Dana-Farber Cancer Institute, Boston and joined the laboratory of Dr. Ramesh Shivdasani. When I joined the lab, a few studies were published, dissecting the role of mesenchymal fibroblasts in the maintenance of the homeostasis of the intestinal stem cells compartment, including one from our lab (McCarthy et al., Cell Stem Cell, 2020, second author). Starting from these studies, I set up a project to understand the role of mesenchymal fibroblasts in the maintenance of gastric stem cell homeostasis (Manieri et al., Nature Communications, 2023). Combining scRNA-seq, whole-mount confocal imagining and RNA FISH, I learned how to connect the tissue spatial organization with gene expression, formulating hypothesis of crosstalk, and validate them using ex vivo organoids co-culture. While in Boston, I also strengthened my expertise in mouse models, by using different inducible knockout lines, and generating a new floxed line in collaboration with Dr. Seruggia (now at CCRI/CeMM, Vienna) and Dr. Orkin (BCH, Boston) labs. I carried on experiments as well as the computational analysis of bulk and single cell RNA-seq datasets. The intestine is also a suitable model to study the role of epigenetics in stem cell differentiation in vivo. I participated in a study that described the role of PRC2, a chromatin repressive complex in maintaining H3K27me3 and gene repression during cell replication (see Jadhav et al. Mol Cell 2020, second author).

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | CORRALES GUERRERO, LAURA |
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| **Correo Electrónico:** | laucorge@us.es |
| **Título:** | Innovative technology for the immobilization of enzymatic cascades into Biomolecular Condensates |

**Resumen de la Memoria:**

My scientific trajectory follows a multidisciplinary line, with a variety of scientific fields including microbiology, molecular biology, protein biochemistry and biophysics. I was awarded with a JAE-Pre fellowship for the consecution of my PhD studies in Molecular Biology at the Institute of Plant Biochemistry and Photosynthesis (IBVF) to study cell differentiation and division in multicellular cyanobacteria. My work was based on genetic engineering and fluorescence microscopy, and led to the publication of 7 articles (5 first-authored), being especially noteworthy the intercellular distribution of regulatory peptides, observed for the first time in cyanobacteria (Mol Microbiol, 2013), and the role of the spatial protein fluctuations in cell differentiation (PLOS Gen, 2015).

I then moved to Philipps-University Marburg (Germany) with a prestigious MSCA-EF fellowship to study cell division using a protein biochemistry and biophysics approach, with a focus on protein-protein and protein-nucleic acids interaction. I also learnt different state-of-the-art Fluorescence microscopy techniques. I was Responsible for the MipZ research line, involving the supervision of 2 PhD, 3 BSc students, and 2 technicians. The MipZ/ParA project led to 2 first-authored scientific articles (Mol Micro, 2019; NAR, 2020), plus one as co-corresponding author (PNAS, 2022). It is also worth mentioning my contribution to the analysis of protein dynamics of the ParB biomolecular condensates (BMCs) (Mol Cell, 2021). The MipZ system allowed me to work with intrinsically disordered proteins (IDPs) and proteins that produce liquid-liquid phase separation (LLPS). There, I got fascinated by the LLPS phenomenon, widespread in both eukaryotic and prokaryotic cells. BMCs have been thoroughly studied as a source of human pathologies, but they are also involved in many physiological contexts, performing different functions such as enhancing enzymatic activity, sequestration or cellular organization.

I continued my studies on LLPS at the University of Seville, where I had a position as Senior Postdoctoral Researcher (Talento-Doctores fellowship). I was Responsible for the Line of research Protein-nucleic acids interaction, in the context of RNA-binding proteins that participate in stress granules, which are BMCs relevant for different human diseases. I had the opportunity to learn Structural Biology notions applied to LLPS-related proteins. This project involved the direct supervision of 2 PhD and 2BSc students, in addition to continuous technicians in internship. So far, I published 3 articles (Front Mol Biosci, 2022; Sci Adv, 2023; Biofactors, 2024; the latter as co-corresponding author) as well as two manuscripts as corresponding under review (NAR, Sci Adv).

In 2023 I obtained funding from La Caixa Foundation – Junior Leader for LLPS utilization in biotechnology, and since February 1st, I will move to IBVF to apply synthetic biology to biotechnology of cyanobacteria. My main scientific focus as an independent researcher will be: (1) further our knowledge about the molecular mechanisms governing LLPS, and (2) exploit their potential uses in biotechnology as enzymatic immobilization systems (in vitro and in vivo), bioremediation, and drug delivery.

**Resumen del Currículum Vitae:**

During my PhD at the IBVF (CSIC, ES), I obtained a JAE-Pre fellowship for the consecution of the PhD studies in Biology (Summa cum laude). I focused on the study of cell differentiation and division in multicellular bacteria. I took advantage of an international stay in the Queen Mary University of London (3 months, UK) to learn Electron Microscopy. This work led to the publication of 7 articles.

I then moved to the Philipps University-Marburg (DE) thanks to MSCA-EF fellowship to undertake an postdoctoral stay investigating cell division in bacteria. During these 6 years, I specialized in protein Biochemistry and Biophysics to study molecular interactions between proteins and nucleic acids with emphasis on MipZ, ParA, FtsZ and ParB, the latter described to perform liquid-liquid phase separation (LLPS). Moreover, I participated as Instructor at the PhD School Expert Courses from the International Max Planck Research School and the SYNMIKRO Graduate Summer Workshop, teaching advanced methods on Fluorescence Microscopy and Protein purification. I also performed a short stay at the Max Planck Institute of Biochemistry in Munich to learn state-of-the-art Fluorescence microscopy techniques. I was responsible for the MipZ subproject, with the direct supervision of 2 PhD, 3 BSc students and 2 technicians. This project led to 3 high-impact first-authored scientific articles (one as co-corresponding author).

After that, I moved to University of Seville with a Talento-Doctores fellowship as Senior Postdoctoral Researcher to be responsible for the Subproject Protein-nucleic acids interaction, in the context of RNA-binding proteins, specifically HuR and TIA-1, both participating in stress granules, which are BMCs relevant for human diseases. Currently I am co-directing a PhD thesis focused on stress granule proteins in the context on BMCs relevant to various human diseases. So far, I published 3 articles (1 in D1 and 1 as co-corresponding author) as well as two manuscripts as corresponding under review (both in D1).

As a measure of professional success, I obtained independent funding throughout my career: JAE-Pre, MSCA-IF, JdC-I, Talento-Doctores, Junior Leader (LaCaixa), Assistant Professor (Genetics Dep), "Contrato de Acceso". To this point, I published 14 scientific articles (9 as first author, 11 Q1, 4 D1) and 1 Editorial, in addition to 2 manuscripts under review and 2 in preparation (H-index: 9 / Total citations: 295). My work was presented on 28 international conferences, 5 talks, and contributed to the organization of 2 international conferences. I participated in 10 scientific projects (1 European as co-PI, 1 German and 8 Spanish). Besides, I peer-review for different high impact scientific journals, I am Expert Reviewer for ANEP, and Guest Editor in Front Mol Biosci. Alongside my scientific duties, I have directly supervised 4 PhD, 1 Exchange MSc, 6 BSc students and 5 technicians, and have been involved in Teaching at BSc, MSc and PhD levels (528 hours, 348 in English). To sum up, I have demonstrated my ability to obtain my own funding for all stages, and to make the most of it; to establish fruitful international collaborations and to lead new projects successfully. In fact, I recently obtained the Certificate of Research Excellence I3 from the Spanish Ministry of Universities, which endorses my excellent scientific trajectory.

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| **Área Temática:** | Biociencias y biotecnología |
| **Nombre:** | RANEA ROBLES, PABLO |
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| **Correo Electrónico:** | pranea88@gmail.com |
| **Título:** | Revealing new roles of peroxisomal metabolism in physiology and disease |

**Resumen de la Memoria:**

My research career spans over 13 years, encompassing extensive training and continuous research in the areas of fatty acid metabolism, peroxisomal biology and metabolic physiology. My productivity is evident in my strong publication record: 15 publications, including 9 in Q1, 10 as first author, and 1 as senior author. H-index: 8, 234 citations.

I started my scientific career as a master student in the laboratory of Aurora Pujol (IDIBELL, Spain), where I also earned my PhD in Biomedicine, investigating the molecular mechanisms underlying the pathophysiology of X-linked adrenoleukodystrophy (X-ALD), a devastating peroxisomal disorder with no cure. Through extensive studies using mouse models and human samples, I identified two therapeutic targets for the treatment of X-ALD, the transcriptional corepressor NRIP1/RIP140 and the antioxidant pathway controlled by the GSK3$\beta$/NRF2 axis. I published 3 research articles (2 as a first author), got 2 competitive fellowships, and attended 2 international conferences.

I continued my career with postdoctoral training in Biochemistry at the laboratory of Dr. Sander Houten at the Mount Sinai School of Medicine (NY, USA), where I sought to contribute to the understanding of the pathophysiology of fatty acid oxidation (FAO) disorders. I led diverse studies under an R01 grant and made significant contributions to the biochemistry and physiology of FAO in mitochondria and peroxisomes, illustrated in two review articles and 5 first-author publications in prestigious international journals. These studies revealed pathophysiological mechanisms and alterations in metabolic homeostasis as a consequence of mitochondrial and peroxisomal dysfunction. I received 1 travel award and was invited as a speaker at 3 conferences.

To further my expertise in the field of Metabolic Physiology, I pursued training in the laboratory of Christoffer Clemmensen at the CBMR (Denmark). I established a mouse model of overfeeding to unravel underlying mechanisms of overfeeding-induced compensatory response that mitigates weight gain. We found that the defense against overfeeding remains intact in obesity, is independent of FGF21 and MC4R, and revealed legumain as a circulating factor of overfeeding. I also authored an extensive review on the physiology of overfeeding in animals. I received a 3-year postdoctoral fellowship (CBMR International Postdoctoral Fellowship, €400,000), 2 travel awards, and 1 conference prize (SEEDO). Additionally, I was invited to present my research at two international conferences and 3 research centers.

I am deeply committed to both scientific outreach and open science practices. I have played a leading role in establishing an international neuroscience symposium for young researchers, organized numerous outreach events for the general public, and championed open access publishing and preprints through my involvement with ASAPbio and my role as a preprint editor.

The recent award of a grant to relocate to the University of Granada in September 2024 (Projects of Applied Research, University of Granada, €159,000) will provide me with an excellent platform to establish my laboratory, where my research goal is to pursue my interest in interrogating the role of peroxisomal fatty acid metabolism in health and disease, with a particular focus on the metabolic communication between peroxisomes and mitochondria

**Resumen del Currículum Vitae:**

I am a postdoc at the CBMR (Denmark) and will start my laboratory at the University of Granada (Spain) in 2024. My research interests lie at the intersection of biochemistry, physiology, and metabolism, with a particular focus on peroxisomal fatty acid metabolism and its role in health and disease.

I completed my Ph.D. in Biomedicine at IDIBELL (Spain), where I investigated the molecular mechanisms of adrenoleukodystrophy. My research identified two promising therapeutic targets: the transcriptional corepressor RIP140 (Ranea-Robles et al. 2022a) and the antioxidant pathway controlled by the GSK3$\beta$/NRF2 axis (Ranea-Robles et al. 2018). I continued my career with postdoctoral training in Biochemistry at the laboratory of Dr. Sander Houten at the Mount Sinai School of Medicine (USA), where I made significant contributions to the biochemistry and physiology of fatty acid oxidation in mitochondria and peroxisomes (Ranea-Robles et al. 2022b; Ranea-Robles et al. 2021a; Ranea-Robles et al. 2021b; Ranea-Robles et al. 2021c; Ranea-Robles et al. 2020; Ranea-Robles et al. 2023, Houten, Wanders, Ranea-Robles. 2020). I took further postdoctoral training in Physiology at the laboratory of Christoffer Clemmensen at the CBMR (Denmark), where I developed a mouse model of overfeeding to investigate the biology of body weight regulation (Ranea-Robles et al. 2023; Lund*, Ranea-Robles*, et al., 2024, shared first authorship). I led a NIH R01 Grant as main responsible (NIH/NIDDK, USA, $2,500,000, 2018-2021), a CBMR International Fellowship as Principal Investigator (PI) in Denmark (CBMR, €400,000, 2021-2024), a PFIS predoctoral fellowship in Spain (Carlos III Health Institute, €85,200, 2012-2016), and a Lanzadera fellowship in Spain (CIBERER, €12,400, 2011). I received a grant from the University of Granada for the attraction of talent as PI in Spain (University of Granada, €159,000, 2024-2026), to start my lab studying fatty acid metabolism and the metabolic interplay between mitochondria and peroxisomes.

I led multiple activities in scientific outreach in Spain, USA and Denmark and organized 2 international conferences (BYNS). I was a lecturer for 3 undergraduate courses at the Icahn School of Medicine at Mount Sinai, and the University of Copenhagen. I have put a great emphasis on following strategies related to open science during my career, serving in the preprint team of the Open Biology journal and organizing activities related with open peer review. I am also a reviewer for several scientific journals. I have mentored 5 students and co-directed 1 bachelor thesis. I have given oral talks at scientific conferences (such as INFORM, PERICO; EMBO). I was invited as a speaker at national research centers (CIBM-UGR, Inibica, and IBiS). My career spans over 13 years of continued work on fatty acid metabolism, peroxisomal biology and metabolic physiology, with a solid international component of six years of experience at excellent centers in the USA and Denmark. I combine a unique experience in peroxisomal metabolism, fatty acid oxidation, body weight regulation and obesity. This places me in an ideal position to develop a research line to investigate the role of peroxisomal

fatty acid metabolism and its interplay with mitochondrial metabolism, with the ultimate goal of developing novel therapies for obesity and peroxisomal disorders.

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| **Área Temática:** | Biociencias y biotecnología |
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| **Título:** | A journey towards generating Hematopoietic stem cells in vitro in vitro |

**Resumen de la Memoria:**

Starting from my PhD studies I have enjoyed working on hematopoietic stem cell (HSC) formation during embryonic development. These cells are very rare (only 1-30 per embryo) and form from specialized endothelial cells (Hemogenic endothelium, HE) that trans-differentiate into hematopoietic cells (HSPC) in the dorsal aorta, the major artery of the embryo. The main goal of my studies is to facilitate the generation of transplantable HSC that could cure patients with blood disorders. This unmeet objective is hindered by our limited knowledge about their ontogeny. In the last decade (since my PhD), I am trying to address some of the key questions in the field. Which transcription factors are important for proper specification of these valuable cells? Where and when are they present in the embryo? Which signaling pathways affect their emergence, what niche do they occupy and finally, what tools can we use to translate our findings into in vitro settings. My line of research therefore contributed to identification and characterization of these rare HSC in vivo by using mouse and zebrafish as model systems. In addition, I extensively utilized ES cell differentiation to blood to perform molecular studies. Subsequently, I realized that notch signaling was an important cue in this process, which led me to join Anna Bigas¿lab in Barcelona. Here, I have made some important discoveries and most of my recent work has led me to deeply think and appreciate mechanisms that drive entry and exit of HSC into cycling. I now have publications in prestigious journals as co-corresponding author, and I am scientifically mature enough to take the next step into independence as a RyC fellow.

**Resumen del Currículum Vitae:**

The first hematopoietic stem cell (HSC) form as clusters within the axial artery during embryogenesis. Initially, their numbers are rare, and only upon migration to the fetal liver and then postnatal bone marrow do they amplify. The knowledge of how HSCs are generated in the embryo is imperative to improve/enable efforts to make transplantable HSC in vitro to cure blood disorders. I started my career in HSC biology during my PhD thesis using zebrafish as a mouse model. After making a first major discovery, ie the transcription factor Gfi1 marks these cells throughout their ontology; I moved to CRUK MI Institute, UK as a Postdoctoral Scientist and intensified these studies using mouse embryos and Embryonic Stem (ES) cell differentiation to blood. Here, I could show the importance, and most crucially the molecular mechanisms that Gfi1 controls during HSC development. Back then, the field knew very little about the molecular signature and the niche of these cells. In order to trace their development, we performed single cell RNA sequencing that contributed significantly to characterize their trajectory. From these studies, I drew the conclusion that one pathway especially, notch signaling, had a key role. I therefore joined Anna Bigas¿lab, an expert on notch signaling in hematopoiesis, to focus on this pathway. From these studies, I have 2 manuscripts accepted in Nature Communications as first and co-corresponding author. In one of these studies, I uncovered a mechanism that is specific for dormancy in HSC (accepted in Nature Communication and deposited in biovrix). In the second study, I performed an in-depth analysis on notch signaling during HSC development (also accepted in Nature Communications and deposited in biorvix). The second study will address many open matters in the field and make significant advances to our current knowledge of HSC emergence. Next to my scientific achievements, I conceptualized the project, wrote the applications, and secured two highly competitive fellowships whilst in the Bigas lab, the latter BP/MSCA 2018 entitles me as a "Marie Curie fellow", and additionally, I am a named recipient on two of the laboratories grants since the applications are heavily based on my experimental data. During this time, I have learnt to lead the projects, i.e. I not only perform experiments and analyze the data, but also take the lead in conceptualizing experimental set ups based on the latest findings and write the manuscripts for these studies. Thus, I am co-corresponding author on both studies. I have a long record of mentoring graduate and PhD students, taking part in activities that display my science to the public, and overseeing collaborations. More recently, I have started to take on more advanced responsibilities in preparation as a future group leader. I am co-organizing monthly seminars about hematopoiesis and I co-chaired the Gordon Research Seminar 2022 on notch signaling in Maine, USA. Moreover, to improve my teaching skills, I took part in a tutor-mentoring program that teaches PostDocs to hold lectures and tutorials at universities. My future goal is to head a group that thrives to excite, teach, and mentor the next generation of scientists about HSC biology and its very important application in regenerative medicine.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | ABANTE LLENAS, JORDI |
| **Referencia:** | RYC2023-043080-I |
| **Correo Electrónico:** | jordi.abante@ub.edu |
| **Título:** | Computational Biologist |

**Resumen de la Memoria:**

Over a decade ago, I graduated from Universitat Politècnica de Catalunya (UPC) with a Llicenciatura in Industrial Engineering, specializing in Power Electronics. A pivotal moment in my career came when I decided to apply my signal processing expertise to the realm of computational genomics, marking a significant shift in my professional trajectory. This realization, that mathematical modeling could tackle crucial questions in science and human health using genomic data, felt like an epiphany.

In 2014, I joined Texas A&M University (TAMU) as a Research Assistant while pursuing a MSc in Electrical & Computer Engineering. Working at the Center for Bioinformatics and Genomic Systems Engineering (CBGSE), I delved into various challenges, from modeling RNA-seq data related to opioids' impact on gene expression to developing novel computational methods for genome and transcriptome assembly analysis.

At JHU, under the guidance of Prof. Goutsias, I not only pursued a Ph.D. in Electrical and Computer Engineering but also earned a MSc in Applied Mathematics and Statistics. Collaborating with eminent scientists like Dr. Koldobskiy, Dr. Ha, and Dr. Feinberg, my work led to the development of computational pipelines for complex epigenetic models. Notably, I contributed to groundbreaking projects, such as the first epigenetic landscape model quantifying DNA methylation entropy and a method for haplotype-dependent allele-specific methylation.

In subsequent years, my journey took me to Stanford University, where I became a Postdoctoral Research Fellow in the Salzman lab, part of the Biomedical Data Science department and the Center for Computational, Evolutionary & Human Genomics. Here, I focused on reference-free approaches to study bacterial and viral evolution, pioneering the first framework for de novo discovery of mobile genetic elements.

In 2023, after nearly a decade pursuing my academic career abroad, I returned to Barcelona. Currently, as a Senior Postdoctoral Researcher at Universitat de Barcelona, I lead computational and genomics work in the Biomedical Sciences Department. Currently, my primary focus lies in developing advanced computational methods for single-cell genomics and calcium imaging analysis using artificial intelligence. Actively contributing to research on developmental alterations in Huntington's disease, my work has already resulted in numerous published works and collaborative endeavors in Europe.

Thus, my scientific trajectory has always revolved around developing mathematical models of complex biological phenomenon through genomics data. Importantly, I have always strived to address important gaps in the field and provide useful tools to the community. Moving forward, I want to put all the skills in probability, statistics, machine learning and artificial intelligence that I have mastered over these past 10 years forward to develop in silico human models trained on multimodal sequencing and imaging data that encapsulate the real biological mechanisms of interest. These models will allow researchers to computationally test biological hypotheses at scale, accelerating basic research and paving the way for more efficient therapeutic avenues to treat human disease.

**Resumen del Currículum Vitae:**

In 2014 I received my BS in Industrial Engineering from the Universitat Politècnica de Catalunya in Barcelona, where I majored in power electronics and signal processing. During my undergraduate, I served as the Team Captain of the Formula Student team, where I helped develop the first electric formula student racecar in Spain. My undergraduate thesis received the Best Thesis award.

After graduating, I went on to obtain an MSc from the Electrical & Computer Engineering department at Texas A&M University (TAMU). There, I joined the Center for Bioinformatics and Genomic Systems Engineering, where I was involved in several computational genomics research projects, under Dr. Aniruddha Datta, including (i) the modeling and analysis of RNA-seq data to study the impact that opioids have at the gene expression level, (ii) the development of a novel computational method to infer the position of nucleosomes in the genome using sequencing data (MNase-seq data), and (iii) the development of a computational method to assess the quality of de novo genome and transcriptome assemblies. This work led to publications in journals like Nature Communications or Genome Biology. During my tenure at TAMU, I had research and teaching assistant positions that helped me fund my graduate studies.

In 2015, I was awarded the "la Caixa" fellowship to pursue research in computational biology during my Ph.D. as a member of the Goutsias lab at Johns Hopkins University (JHU), developing computational methods to study epigenetic signatures and their interplay with the transcription machinery in close collaboration with the Feinberg lab of the JHU School of Medicine. In addition to my research and Ph.D. coursework, I earned an MSc focused on statistical learning from the Applied Mathematics & Statistics department at JHU in 2018. During my tenure My work at JHU led to the publication of several papers in top journals, including Nature Communications, Nature Biomedical Engineering and Nucleic Acids Research. During my tenure at JHU, I was a research assistant throughout, and teaching assistant in 3 graduate courses in the department of Biomedical Engineering.

After successfully defending my dissertation entitled "Statistical Signal Processing Methods for Epigenetic Landscape Analysis" on May 10 of 2021, I joined the Salzman lab at the Biomedical Data Science Department in Stanford University as a Postdoctoral Research Fellow being awarded the postdoctoral fellowship from the Center for Computational, Evolutionary and Human Genomics. At Stanford, I focused on the development of the first reference-free approaches to study the bacterial mobilome, leading to a publication in Genome Biology recently.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

In January of 2023, I joined the Departments of Biomedical Sciences and Mathematics and Computer Science at Universitat de Barcelona (UB) as a Senior Postdoctoral Researcher. Here, I develop computational methods to leverage single-cell data of different modalities to study the brain alterations during development in Huntington's disease.

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| **Área Temática:** | **Biociencias y biotecnología** |
| **Nombre:** | RUIZ RODRIGUEZ, ALICIA |
| **Referencia:** | RYC2023-044386-I |
| **Correo Electrónico:** | aliruizrodriguez@ugr.es |
| **Título:** | Microbiota and neurodevelopment: unraveling mechanisms and implementing solutions |

**Resumen de la Memoria:**

I have always been fascinated by the microbes that live in/on the human body and the role they play in human health and diseases. During my phD at the University of Granada (UGR), I focused on the study of the gut microbiome and the functional adaptation to changes produced by environmental forces. We were one of the pioneering groups anticipating that not only composition of the gut microbiota was important but also functionality was essential (3 publications and 9 conferences).

I worked on additional projects where we analyzed gut microbial community and functional dynamics, through metaproteomics, during early life and their association with pre-pregnancy mother's weight, and infant's neurodevelopment (7 publications, 2 book chapters and 14 conferences, with several awards). Overall, in our laboratory, I was in charge of optimizing and setting up the data analysis approaches.

After my thesis defense, I was awarded a Ramon Areces fellowship for postdoctoral studies, which I carried out at the University of Edinburgh under the supervision of prof Debby Bogaert (h56). Always working on the idea that we need a holistic approach to understand the role of the microbiome in human physiology, and that the microbiota is not composed by bacteria exclusively, I proposed to study the fungi component of the respiratory microbiota. I had to establish and optimize a new protocol including wet laboratory experiments, bioinformatics pipeline and processing of the data (1 publication in prep). Hence, my postdoctoral experience has provided me with an excellent background in multiple biological and computational disciplines. Then, in my second post-doc, I worked with Prof. Donald Davidson (h55) to investigate the interplay between host defenses and microbiota of the respiratory tract in relation to viral infection. At this time, I completed training in "human RNA extraction from samples with very low biomass" at the RIVM in Utrecht. Unfortunately, I could not generate results from this project because the pandemic started. Instead, I moved back to prof. Bogaert group to collaborate in projects focused on the study of the respiratory microbiota (bacteria and fungi) in COVID-19 patients in which we applied the new protocol I had optimized previously (1 publication). Besides, I collaborated in a project where we studied the influence of an Influenza vaccine on the respiratory microbiota of Gambian children (under revision in The Lancet Microbe IF 86.2,1/137).

Recently, I am back to UGR with a Maria Zambrano contract. I joined the group of Prof Margarita Aguilera mid 2022 (after my maternity leave) to investigate the effect of dietary xenobiotics in children's gut microbiota (5 publications, 4 accepted and 1 in press, CA in all of them). Besides, during this period we finalized and published a very interesting research that is the foundation for the current application. Using metagenomic sequencing, metaproteomic, chemical identification and germ-free mice, we were able to demonstrate a link between gut microbiota, histidine metabolism and cognition in infants. This was published in a very high impact journal (Cell Host and Microbe IF 30.3) in which I am the corresponding author. My results will open new opportunities for the development of targeted microbiota modulation strategies.

**Resumen del Currículum Vitae:**

My research interests focus on a better understanding of the role of the microbiome in health and diseases. To advance in this field, I propose an integrative approach that combines information on the composition and functionality of the microbiome, as well as the study of different components of the ecosystem other than bacteria. All of this incorporating also physiological data from the individuals. Recently, I am focusing on the search of the complex molecular processes contributing to the interplay between gut microbiota and neurological development during early life. To achieve this, I build on my degree in Pharmacy and my complementary bioinformatic, statistics, and data analysis skills acquired during my PhD and postdoctoral training. My dual skills to understand biology and perform complex data analysis have put me in an excellent and very competitive position to make significant contributions to the research field.

I have published my work in scientific peer-reviewed journals (22 articles/10 first author/4 corresponding author, 3 in D1, 11 in Q1), 7 book chapters and one book editor coordinator. I have presented my work at several international conferences and seminars (>30 posters, talks and invited talks, and 6 communications were awarded). I have also participated in several activities for the general audience to disseminate science: seminars for laboratory technician students, organization of the "World Pneumonia day" and currently carrying on a tutorial action plan for students at the Faculty of Pharmacy to learn how to interpret and give advice in relation to gut microbiota analysis. I have also participated in the organization and execution of the I MPRU Microbiome course, Malawi 2021.

During my scientific career, I have obtained funding in highly competitive calls and managed to secure funding for my salary: FPU grant (2011-2011) from Ministry of Education and Science, two grants for international short stays, one from the International Mobility CEIBIOTIC Program (hosting institution: University of Michigan,2013) and the other form the FPU mobility program (hosting institution: University of Wageningen 2014). One year of postdoctoral contract funded by the University of Granada (2016-2017). Two years postdoctoral fellowship from the prestigious Foundation Ramon Areces (hosting institution: University of Edinburgh 2017-2019), one 2-years postdoctoral contract within the University of Edinburgh (2019-2021). Finally, two-year fellowship to develop my own project at the University of Granada, María Zambrano scheme (Next Generation EU funding) (2022-2024).

I have participated in 13 different national and international funded projects, with major responsibilities in many of them, especially the most current ones. These projects, together with my international short and long stays allowed me to work in an international and multidisciplinary environment and to establish long-term collaborations.

During my PhD and postdoctoral period, I taught practical and theoretical courses at the Degree in Pharmacy, Nutrition and Food Science and Technology and supervised 18 undergraduate students and 3 master students. Currently, I am supervising 1 master student and 2 phD students.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ALONSO CURBELO, DIRENA |
| **Referencia:** | RYC2023-045857-I |
| **Correo Electrónico:** | direna.alonso-curbelo@irbbarcelona.org |
| **Título:** | Functional dissection of the neoplastic co-option of inflammatory ecosystems in pancreatic cancer |

**Resumen de la Memoria:**

Dr. Alonso-Curbelo obtained her PhD in 2013 under the supervision of Dr. Marisol Soengas at the National Cancer Research Center (CNIO; Madrid, Spain), with Cum Laude and an Extraordinary Award. She then joined the laboratory of Dr. Scott W. Lowe at Memorial Sloan Kettering Cancer Center (MSKCC; New York, USA) as a postdoctoral researcher. She is currently a tenure-track group leader at the IRB Barcelona since the fall of 2021.

The Alonso Curbelo lab combines flexible mouse models, single-cell profiling methods and functional genomics tools, to understand molecular, cellular, and tissue-level mechanisms of cancer pathogenesis, with a particular focus on pancreatic and liver malignancies. She has an excellent track record of scientific productivity (23 peer-reviewed publications, >2700 citations, h-index: 19), including publications as leading author in Cancer Cell (2014), Cancer Discovery (2016; 2023), Nature (2021) Science (2023), and has been honored with >10 national and international awards, including the prestigious Blavatnik Regional Award for Young Scientists and recently the Cancer Discovery Early Career Award. Conscious about the need to promote equity in scientific research and communicate research findings to the society at large, Dr. Alonso-Curbelo also continuously participates as speaker and coordinator of events aimed at promoting diversity values and STEM vocations, universities (e.g., Las Palmas; Spain) and high schools (e.g., Aspen, USA).

The proposed aims to delve into the early stages of pancreatic cancer, building on recent discoveries by Dr. Alonso Curbelo. Previous research revealed chromatin aberrations triggered by the interaction of pancreatitis and mutant KRAS, driving tumor formation. Additionally, a single-cell atlas, spanning from normal tissue to metastatic lesions, uncovered abnormal cell-cell interactions in this process. Leveraging these insights and new data, the proposal will focus on understanding the cellular and tissue-level mechanisms behind the collaboration between mutant KRAS and inflammation in shaping cell-to-cell diversity during disease progression. I hypothesize that epigenetic dysregulation of cell-cell communication programs in the early stages of neoplastic transformation enables tumor-promoting interactions between mutant epithelial cells and both local and systemic inflammatory environments. To addres this, we will employ advanced single-cell analyses, in vivo models, and functional genomics techniques to map and manipulate pathways facilitating communication between tumor cells and inflammatory niches, assessing their role in tumor development. Through established clinical collaborations, we will also evaluate their significance as prognostic indicators using well-characterized patient biopsies. Given that difficult-to-treat cancers like pancreatic cancer are typically diagnosed in advanced stages, understanding these processes is crucial for laying the foundation for more precise methods of detecting and intervening in pancreatic cancer before it progresses to an untreatable state.

**Resumen del Currículum Vitae:**

I am a tenure-track group leader at the Institute for Research in Biomedicine (IRB), leading the Inflammation, Tissue Plasticity & Cancer group. My laboratory investigates how oncogenic mutations and inflammatory cues promote cancer, aiming to expose tumor-specific vulnerabilities to improve its detection and treatment.

Throughout my scientific career, I have been interested in understanding the fundamental mechanisms that make the 'cancer state' unique. My PhD research focused on endolysosomal trafficking in cancer cells (Cancer Cell 2014, 2009; Autophagy 2010), yielding 9 publications and an Extraordinary PhD Award. I then undertook my postdoctoral training at MSKCC (USA) aiming to dissect mechanisms directing the immune surveillance of senescent cells (Cancer Discov 2016) and the earliest stages of pancreatic cancer (Nature 2021). My postdoc work contributed to multiple collaborations, yielding 14 additional high-impact publications and 1 filed patent.

Demonstrating my capacity to lead projects as an independent PI, I have published as corresponding author (Cancer Discovery 2023), acquired competitive national and international funding (+1M €since 2021); and participated in several research networks, including one I coordinate (SGR-Cat-2021). In addition, in collaboration with the Pe'er lab (MSKCC, USA) we dissected epigenetic principles underlying inflammation-driven tumorigenesis at single-cell resolution (Science 2023).

My research to date has been distinguished with >10 national and international awards, including the Cancer Discovery Early Career Award (2024) and the prestigious Blavatnik Regional Award (2021). I have been an invited speaker at 30+ international conferences and institutes (e.g. EACR meeting, Cold Spring Harbor (USA)). Further supporting my international leadership, I co-organized an international meeting (Biomed Conference: ¿Cancer IN CONTEXT¿; 2023); regularly serve as an evaluator for national (e.g. La Caixa, AECC) and international (e.g. AACR, ERC) organizations, a reviewer (e.g. Nature, Gut, Cancer Research); and as an expert advisor in international initiatives (e.g. European UNCAN.eu; Cancer Grand Challenges 2023).

I am also deeply committed to training the next generation of scientists. At MSKCC, I was co-director of a PhD student (now post-doc at Rockefeller University). I currently supervise a multidisciplinary team of 3 PhD students, each awarded with predoctoral fellowships (AECC, FI-Agaur, IRB Dream Marie Curie co-fund); 1 post-doc supported by an EMBO postdoctoral fellowship; a postdoctoral bioinformatician; 1 Fulbright Scholar (from USA) and a Master Student. In parallel, I have participated in extramural teaching activities (e.g. guest lecturer at Cold Spring Harbor Lab (USA), BIST Barcelona); and I currently serve as Thesis Advisory Committee member for 10+ students at IRB Barcelona, VHIO, and the IEO (Milan). I also actively organize and participate in science outreach activities and initiatives tackling diversity issues (e.g. CONÓCELAS 2021-2023).

Altogether, I believe that my track record of scientific productivity and my commitment to pursuing innovative research put me in a strong position to develop an impactful independent research program at the intersection of cancer and inflammation fields, and train the next generation of cancer scientists.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | AGUILAR JURADO, CARMEN |
| **Referencia:** | RYC2023-043543-I |
| **Correo Electrónico:** | carmen.aguilar.jurado@gmail.com |
| **Título:** | Harnessing the power of host pathways to control urinary tract infections |

**Resumen de la Memoria:**

Bacterial infections claim millions of human lives every year and they represent one of the most common causes of death in the world. Although antibiotics have been successful in treating bacterial infections, due to their misuse and overuse, they are becoming increasingly ineffective as antimicrobial-resistant (AMR) bacteria spread globally. Thus, new therapeutics are urgently needed. Although increased efforts are being made to develop new antimicrobial approaches, treatment for AMR infections remains scarce. Given that the host response is equally essential in determining the outcome of an infection, host-based or host-directed therapeutics represent an innovative approach to fighting infections. My whole scientific career has been dedicated to the study of gastrointestinal bacterial pathogens, how they cause disease, how the host responds and how we can use the host response to control the infection outcome. Using state-of-the-art technologies such as genome-wide microRNA profiling, adult stem cell-derived organoids and single-cell RNA sequencing, I have identified new host factors and their downstream pathways with the prospect of developing new therapeutic strategies to fight AMR bacterial infections. I discovered several host microRNAs able to control Salmonella Typhimurium and Shigella flexneri infection of intestinal epithelial cells. In addition, I have identified a new cell type in the human gastric epithelium as a new cellular target of Helicobacter pylori.

In 2022, I was awarded the prestigious grant "Promotion of Junior Research Groups in Infection Research", from the German Federal Ministry of Education and Research, to establish my independent group at the Institute of Molecular Infection Biology (University of Würzburg). For this, I decided to use my expertise in host pathways regulation in infections to tackle one of the most common infections worldwide, urinary tract infections (UTIs). UTIs caused by uropathogenic Escherichia coli (UPEC) are one of the most common bacterial infections worldwide and, consequently, a major reason for antibiotic prescriptions. Current treatments rely almost exclusively on antibiotics, fostering antimicrobial resistance and failing to effectively treat recurrent infections. Considering the importance of the host response in determining the infection outcome, host-based therapeutics offer a novel approach to combating UTIs. However, the development of such therapies requires a detailed understanding of the host pathways involved in the infection process. Therefore, the global aim of my research group is to identify and functionally characterize novel host factors that influence UPEC infection in the human bladder and prostate epithelium. Based on our preliminary data, I hypothesise that specific host determinants control the outcome of the infection and that interfering with those factors or their signalling pathways represents an innovative approach to fighting these infections. The identification of novel host targets in our physiologically relevant infection models will provide us with a list of candidates that could be targeted by existing drugs or utilized as novel drug targets. Overall, research in my lab will contribute to the development of new therapeutic strategies to defeat UTIs and will advance the fight against antimicrobial resistance in Gram-negative pathogens, in general.

**Resumen del Currículum Vitae:**

PHD DEGREE: Department of Genetics (University of Córdoba), under the supervision of Prof. Dr. Juan José Garrido Pavón (Genomics and Animal Breeding Research Group).
-Major outcome
Five articles: Aguilar C, et al. Vet Immunol Immunopathol. 2014. PMID: 25307769; Martins RP, et al. Vet Res. 2013. PMID: 24308825; Collado-Romero M, et al. Front Cell Infect Microbiol. 2015. PMID: 26389078; Ayllón N, et al. Front Cell Infect Microbiol. 2017. PMID: 28491823; Herrera-Uribe J, et al. Vet Res. 2018. PMID: 29391047.
-Short-term fellowships (National and European): 14.6 K€

POSTDOCTORAL RESEARCH I: Lab of Dr. Ana Eulalio at the Institute of Molecular Infection Biology (IMIB, University of Würzburg, Germany).
-Major outcome
Expertise in state-of-the-art technologies in RNA-seq and miRNome analysis.
Four articles and two reviews: Sunkavalli U, Aguilar C, et al. PLoS Pathog. 2017. PMID: 28394930; Tawk C, et al. EMBO J. 2018. PMID: 30389666; Aguilar C, et al. Microbiol Spectr. 2019. PMID: 31152522; Aguilar C, et al. Trends Microbiol. 2019. PMID: 30477908; Aguilar C, et al. Nat Microbiol. 2020. PMID: 31792428; Aguilar C, et al. Nat Commun. 2021. PMID: 34099666.
-Grants and fellowships: Prestigious PostDoc Plus Funding (University of Würzburg, 13K€) and the Bayerische Gleichstellungsförderung grant (Bavarian Government, 26K€) to carry out my own research project.

POSTDOCTORAL RESEARCH II: Lab of Dr. Sina Bartfeld at IMIB (University of Würzburg, Germany).
-Major outcome:
Expertise in organoid and scRNA-seq technologies.
One review and two articles: Aguilar C, et al. Exp Mol Med. 2021. PMID: 34663936; Wallaschek N, et al. PLoS Pathog. 2021. PMID: 33596248. Aguilar C, et al. Nat Commun 2022 PMID: 36198679

GROUP LEADER since May 2022 at IMIB (University of Würzburg, Germany).
-Grants: Three grants with a total of 2.4 Mio € Research group with eight members (three PhD students, one postdoc, two master students, and a technical assistant).

MENTORING

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Since 2015, I have trained several students, including eight PhD students, and eight Master students. In addition, I am part of the thesis Committee of three other PhD students. I have taught and organized several courses, including the EMBO course "Non-coding RNA in infection" in 2016 (Würzburg, Germany), the workshop "Organoids and Advanced 3D in vitro Models for Research in Health and Disease" in 2020, the "Advanced course in Organoid models" in 2021 and 2022, and the "Organoids systems for the study of infection" in 2021, all at the I3S Institute (Porto, Portugal).

SUMMARY PRODUCTION
I have 17 publications in peer-reviewed journals (all in Q1; 10 of them as first-author), including first-author articles in Nature Microbiology (IF: 28.3), Trends in Microbiology (IF: 18.6), Nature Communications (IF: 16.6), Experimental & Molecular Medicine (IF: 12.8), Microbiology Spectrum (IF: 9), PLoS Pathogens (IF: 6.7), and Veterinary Immunology and Immunopathology (IF: 2). Total cited = 349 (Google Scholar); h-index: 12; i10-index: 14; Total IF: 163.6; IF per document: 10.9; 2 book chapters (one of them in a book from the American Society for Microbiology). I have participated in 16 international conferences, and I have secured 2.4 Mio € in third-party funding and have been directly involved in the execution of three European grants (CampyRNA, Infect-ERA; StaphIN, Infect-ERA; REMODEL, H2020).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | BANDRÉS CIGA, SARA |
| **Referencia:** | RYC2023-043453-I |
| **Correo Electrónico:** | sarabandres@gmail.com |
| **Título:** | Unraveling the genetic architecture underlying the etiology of neurological conditions |

**Resumen de la Memoria:**

Over the last 11 years, my research has made significant contributions to our understanding of the etiology of neurodegenerative diseases, spanning the etiological genetic risk spectrum from monogenic to more complicated sporadic forms. This includes applying data science and statistical genetics to multi-modality clinical and genomic datasets at scale. My PhD research was anchored in studying genetic risk factors associated with Parkinson disease (PD). I applied modern sequencing and genotyping technologies to characterize the genetic architecture of disease, age at onset and progression and built risk prediction models.

As a Postdoctoral Fellow, I joined a team worldwide known for unraveling molecular genetics underlying the etiology of neurodegenerative diseases at the National Institutes of Health (NIH, US). Since then, I became an active member of the International Parkinson Disease Genomics Consortium and built the second largest genotyped cohort from Spain. I carried out this project from conception to execution. This initiative was crucial for the replication phase of the largest PD risk meta-analysis to date and the identification of PD age at onset modifiers, among other projects. I also shifted some of my interests to the study of comorbidities and causal risk factors associated with neurodegenerative diseases. I performed the first large-scale Mendelian randomization studies in amyotrophic lateral sclerosis and in PD. Starting with these manuscripts and apps, I began to realize that I very much enjoyed efforts that integrated hands-on research opportunities coupled with democratizing and sharing scientific knowledge and tools with both the public and the immediate research communities. This is where I began to put considerable effort into scientific knowledge transfer and training to accompany my own research goals.

In 2022 I was promoted to Senior Staff Scientist at the Centre for Alzheimers and Related Dementias (CARD, NIH) where I am also the Head of Training and Outreach. By combining all the knowledge acquired during my PhD, five-year Postdoc and Senior Staff roles, I created an independent research program that significantly differs from my former supervisors, but clearly defines the line of research I want to follow during my career: To explore the genetic architecture of two understudied but prevalent movement disorders: essential tremor (ET), and restless legs syndrome (RLS) for which there is limited understanding on their genetic etiology. The proposed project will address the existing gaps in understanding the epidemiological characteristics and comorbidities between PD, ET, and RLS, leveraging large-scale biobanks that encompass all three conditions, namely, All of Us and the UK Biobank. Utilizing whole-genome sequencing, I will lead the largest genome study for ET and RLS. In contrast with my previous work, this novel multifaceted approach is poised to enhance our comprehension of both shared and unique mechanisms underlying movement disorders.

My goal is to work for the advancement of neurodegenerative disease research and training the new generations of Spanish scientists. As a lead in the field, I want to leverage collaborative research focused on the application of novel technologies, promote data democratization, and build better bridges Spain, NIH and all potential teammates around the world

**Resumen del Currículum Vitae:**

I am an international researcher with creativity and skills to drive global collaborations, and with a steadfast commitment to training, leadership, staff development, equity, and diversity. To date, I have co-authored over 125 peer-reviewed publications in this area of research of which over 20 are first/co-first author publications and 19 are last author/corresponding author contributions in Q1 journals [H index = 34, cites Jan/2024 = 5166].

In 2013 I received a competitive FPU Fellowship to conduct my PhD studies in the genetics of Parkinson's disease. In 2017, I joined the Laboratory of Neurogenetics at the NIH as a Postdoctoral Fellow as part of the competitive Intramural Research Training Award program. In 2022, I was promoted to Senior Staff Scientist at the Centre for Alzheimer's and Related Dementias (CARD, NIH) where I currently lead the Neurogenetics group. I am the Head of Training at Outreach at CARD where I oversee and coordinate the training portfolio at the center, including the creation of fellowships, international liaisons, and career development opportunities.

I have received several scientific recognitions including the 2023 NIH Special Act Recognition, 2022 NIH Scientific Directors Award, 2022 FAES Academic Programs Excellence in Teaching Award, Nova 111 list - 3% Top Spanish Talent - Healthcare & Life Sciences, 2021 NIH Fellows Award for Research Excellence (FARE), 2020 NIA IRP Scientific Retreat – Nathan Shock Best Communication Award, 2019 and 2020 Nathan W. Shock Postdoctoral Mentorship Award, 2019 NIA Summer Mentorship Award, 2019 NIA Women in Science Excellence in Research Award and 2016 Outstanding Thesis Award in Biomedical Sciences at the University of Granada.

I co-lead the genetics and omics group at the International Deep Dementia Phenotyping (DEMON) Network and I am the principal investigator of the Black and African American Connections to Parkinson's Disease Study (BLAAC PD;https://www.blaacpd.org/DJYD/) funded by the Michael J Fox Foundation and the National Institutes of Health. I have extensively collaborated with industry and the private sector. I am the main developer of NeuroBooster Array, a novel genotyping array designed in collaboration with Illumina Inc. The array is currently commercialized.

I am passionate about training, democratization and promoting inclusivity in science. I have supervised over 15 trainees and my team is currently composed of 3 postdoctoral fellows and 2 master students. I have served as instructor at the Foundation of Advanced Education in the Sciences where I used to teach "BIOF 309: Introduction to Python". I co-lead the Training, Networking and Communication Working Group under the Global Parkinson's Disease Genetics Initiative (GP2). I have given over thirty invited talks/seminars. To improve the quality of science within the scientific

community, I actively act as a manuscript reviewer for multiple Q1 journals. So far, I have registered 79 verified revisions in 18 journals. I act as a grant reviewer for the Michael J Fox Foundation, Parkinson's Foundation and the Stichting Alzheimer's Onderzoek Program and I am a member of the editorial board of Annals of Neurology. I understand the responsibility that a scientist has to inform and engage the public and I have been recently awarded with the 2021 ECUSA Science Dissemination Award.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ZABALETA LASARTE, NEREA |
| **Referencia:** | RYC2023-043277-I |
| **Correo Electrónico:** | nerea.zabaleta.lasarte@gmail.com |
| **Título:** | Applications and engineering of adeno-associated viral vectors (AAV) for inherited and infectious diseases |

**Resumen de la Memoria:**

My career has been focused on the development of novel gene therapies and gene delivery tools for inherited and infectious diseases using adeno-associated viral vectors (AAV). During my PhD, I developed a treatment for a rare genetic disorder of hepatic origin, Primary Hyperoxaluria type I (PH1). This was a gene editing treatment delivered in vivo using AAV vectors to target an enzyme involved in the production of oxalate, main mediator of the physiopathology of the disease. I designed, performed and analyzed all the experiments, decided the direction of the project and prepared the manuscript. The experience acquired during my PhD gave me expertise in translational gene therapy for monogenic disorders using viral vectors.

My postdoctoral training was focused on the characterization of AAV biology, transduction mechanisms and immune recognition by the host. I participated in a project that discovered a new AAV entry factor called GPR108, in which I demonstrated that GPR108 was essential in vivo and generated several chimeric AAV capsids with altered GPR108 dependence. Later, the COVID-19 outbreak led our lab to initiate the development of an AAV-based vaccine. I oversaw the pre-clinical development of the vaccine by designing studies, supervising the work of research assistants and students in the lab and managing external collaborations. This work resulted in the extensive characterization of a novel vaccine platform that addresses some of the limitations of the current vaccine approaches. During these years I gained a lot of experience designing and engineering AAV vectors, both the genome (to express different genes) and the capsid (to alter tropism).

Finally, during the past 2 years, as an independent researcher, I have focused on 2 main research lines: the development of AAV vectors with improved tropism for the heart and the improvement of AAV manufacturing. Both projects involved engineering, the first one of the AAV capsid with extensive in vivo characterizations and the second one of the elements involved in the production of AAV and following in vitro assessments. I have supervised these projects and the postdoctoral fellows involved in them, obtained funding for both, managed collaborations and worked towards publication and patent filing.

The different experiences and research projects of my trajectory converge in the current proposal. Here, I propose to develop novel technologies and therapies for inherited kidney diseases. More specifically, I plan to focus on in vivo gene therapy and gene editing for Autosomal Dominant Polycystic Kidney Disease (ADPKD), a disease of high prevalence (1:1,000) that has no existing curative treatment. I propose 3 specific aims to achieve this goal: 1) Development of AAV vectors that enable a potent and specific transduction of the kidney; 2) Characterization of novel AAV-CRISPR therapies in mouse and pig models of ADPKD, and 3) Design of personalized prime editing approaches to correct ADPKD-causing mutations in patient-derived kidney organoids. This proposal entails a new field for me, but kidney gene therapy is a new field with a high unmet need and few research groups focused on it. Entering this field with all the experience I have acquired gives me the opportunity to create a long-term niche for my career and establish myself as an expert in the field of kidney-directed gene therapy.

**Resumen del Currículum Vitae:**

General quality indicators: H Index: 10; i10 index: 11; Research Interest Score: 277.9; Total Citations: 552; Publications: 21; PhD director: 1; Master's thesis director: 2.

I have had several research positions during my career. I was a PhD student from 2014 to 2018 at CIMA, Universidad de Navarra, and I defended my PhD on February 26th, 2018. I was hired as postdoctoral fellow at CIMA until December 2018 to finish my PhD work and publish a paper. In 2019, I joined Harvard Medical School and Mass Eye and Ear as a Postdoctoral Fellow with a Fundación Alfonso Martín Escudero grant that funded 2 years of my salary. In 2022, I was promoted to Research Instructor at Harvard Medical School and Mass Eye and Ear, and I started my work as an independent researcher.

During my career, I have authored 16 research articles, of which 4 were as first author, 1 as co-last author and 1 as corresponding author. Additionally, I have published 5 review articles, and I was first author in 4 of them. I have also participated in several national and international conferences: 4 as invited speaker, 6 as oral abstract presenter and many others as a poster presenter. The work done during my career has also resulted in 3 patents, in which I am listed as an inventor, and one of them has been licensed to the biotech company Affinia Therapeutics.

Additionally, I have obtained funding for different activities and projects during my career. I had grants that covered my salary during my PhD and my postdoctoral training, as well as funding for the 2 international internship I performed during my PhD. Finally, during the last 2 years, as an independent researcher I have been awarded with the prestigious Big Beat Challenge of the British Heart Foundation (BHF) as part of the CureHeart consortium formed by 7 international researchers (~1.2million € for my work package). I have also obtained the Novel Therapeutics Delivery Grant from Massachusetts Life Sciences Center (~640,000 €) and secured a contract with the biotech company Akouos (~275,000 €).

Apart from research, I am very invested in the improvement of several aspects of the scientific community, such as, mentorship, diversity and equity, and communication of science. I actively seek to mentor PhD students and undergrad research assistants to create opportunities that will allow their professional development. Additionally, I am a board member of the Boston Chapter of Spanish Scientist in the USA (ECUSA, nonprofit organization) and I acted as co-chair of the committee for gender equity in science for two years. I have organized several events to give visibility to women scientists, to raise awareness about biases, and to provide mentorship to women scientists.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ÁGUILA MARTÍNEZ, SONIA |
| **Referencia:** | RYC2023-043714-I |
| **Correo Electrónico:** | sonia.aguila@um.es |
| **Título:** | Deciphering thrombotic and hemostatic mechanism to fight thrombosis and bleeding disorders |

**Resumen de la Memoria:**

I began my research career in thrombosis and hemostasis field at Prof. Vicente Vicente's lab (Hematology and Oncology research group, Blood Donor Center). Specifically, my PhD (2010-2014) was focused on the main endogenous anticoagulant, antithrombin, finding that alterations in the glycosylation caused by missense mutations, promote thrombosis. The internationalization of my PhD was carried out with two stays, at the Université Paris Sud-XI (Borgel's lab) and at the University of Illinois at Chicago (Olson's lab). My PhD resulting in 4 first author papers and the PhD Award in Medicine (Universidad de Murcia). Next, I obtained a postdoctoral position (2015-2019) in the Hemostasis Research Group, Institute of Molecular Medicine, Trinity College Dublin, under the supervision of Prof. James O'Donnell. The goal of my contract, funded by the Health Research Board, was to study the pathophysiology of von Willebrand factor (VWF), a crucial hemostatic protein. During my postdoc, I collaborated with Prof. Jorge Di Paola expending 9 months at University of Colorado, Denver, to characterize the genetic profile of Low VWF patients designing a customized NGS panel. We concluded that changes in glycans compositions, no determined by genetic mutations, influence plasma VWF levels and the bleeding phenotype of these patients. In 2017, Prof. O'Donnell's lab moved to RCSI and I obtained a second contract funded by Science Foundation Ireland (SFI) and Takeda Pharma Company for 4 years. During the las 2 years, I was focused on the link between the hemostatic system and immunity. The results of this period were collected in a first author publication in Nature Comms (2022), and other Blood plenary paper (2019) as contributing author, where we described that VWF provokes a proinflammatory response driving macrophage metabolic shift; and how TNFa conditions platelet mitochondria and activation in aging, respectively. Then, I got the Sara Borrell (2019-2022, ISCIII) contract to return to Spain at the Hematology research group to continue deepening in the crosstalk between coagulation and immunity and its regulation by epigenetics elements. Finally, in August of 2022 I began my Miguel Servet contract (2022-2027, ISCIII), and I got important grant from AEI (187,500€) and Fundación Séneca (99,000€) 2022 to investigate the mechanisms of thromboinflammation in aging to prevent the thrombotic and cardiovascular event in this population and in progeria, focusing in the metabolic reprogramming of myeloid cells, a topic poorly studied in our field. In summary, I have published 36 papers in the top Hematology journals. I got 5 Young Investigator Awards for my oral communications at the International Society of Thrombosis and Hemostasis (ISTH), the most relevant congress in this field. In 2019, I obtained a training fellowship from the same society for early career to do a stay in I2MC, Toulouse. I would like to highlight my capacity to lead, two grants, R&D contract in 2020 (Incyte), two awards for my projects as early career researcher from SETH, all of them as PI, and funding for staff (RA and a PhD student). Finally, I have directed 1 MSc at TCD, Ireland; and 3 MSc, 2 BSc and 1 PhD student at UMU, Spain. Moreover, I do some teaching in Biotechnology degree (UCAM) in Fundamentals in genomics, proteomics and metabolomics subject, also in the Master of Hematology (UMU).

**Resumen del Currículum Vitae:**

I have 36 publications (11 of them in D1 journals, 7 of them as main author; and 24 Q1), 822 total citations; average of citation per year is 146.2 in the last four years. My H and Crown index are 15 and 2.84, respectively. I have two publications ≥100 citations. I presented 80 communications in conferences; one of them was presented in the highlight session of ISTH congress Philadelphia 2021 as top 5 scientific communications of the meeting. I was awarded with 5 Young Investigator/Early Career Award and the International Training Fellowship for early career researchers, all of these awards from the most relevant society of my field (Internationla Society of Thrombosis and Hemostasis, ISTH 2013, 2015, 2017, 2021, 2023). Moreover, I achieved the PhD prize. Regarding R&D, I had two patents (2013, 2023) and a contract with a Pharmaceutical company, Incyte (22,000€) as PI. Finally, I have obtained Miguel Servet contract from ISCIII (August 2022- August 2027). I lead two important grants, one national from AEI (187,500€, 2024-2026), and the other regional from Fundación Séneca (99,000€, 2023-2025); and two awards from Spanish Society of Thrombosis and Hemostasis (SETH-2020, 2023) to early career researchers' projects as PI. Furthermore, I obtained funding to contract a research assistant for three years, and a PhD student for one year (Programa Investigo). Collectively, the most relevant findings of this period (2017-2022) are 2 Blood publications (IF:20.3), 1 Nature Comms (IF:16.6), 1 Clin Transl Med (IF:10.6), all as first or corresponding author; another 3 publications in Blood, 2 in JTH (IF:10.4), 1 in Blood Adv (IF:7.5), 1 in Haematologica (IF:10.1) as contributing author and 3 reviews as first authors. In 2022, I started the Miguel Servet contract for 5 years to establish my own research group. I have worked in 6 different research centers throughout my career (Blood donor center-IMIB, Spain; Chicago, US; Paris, France; Dublin, Ireland; Denver, US; Toulouse France; CNIC, Spain) and give me the opportunity to acquire new skills and establish outstanding national and many international collaborations (US, Ireland, Australia, Germany) with worldwide expert in my research focus. For training and teaching, I have directed 1 MSc at TCD, Dublin, Ireland together with some teaching for medical student at RCSI, 3 MSc at Universidad de Murcia (UMU), Spain, 2 BSc of medical students; and I am directing a PhD student, UMU. I am the professor in charge of the Genomics, Proteomics and Metabolimics Fundaments subject in the Biotecnology degree at Universidad Católica San Antonio de Murcia (UCAM) Murcia, Spain, and also in the Master of Clinical and Experimental Hematology and Oncology, UMU of our research group.

**Resumen de la Memoria:**

I am a scientist with a far-reaching understanding of current societal health issues, with a robust methodological reasoning and international experience.

My cutting-edge research on respiratory infections, particularly pneumonia (acute model) and tuberculosis (chronic model), has been on understanding mechanisms of severity on the short- and long-term and the role of biomarkers and severity scores. By validating and assessing the clinical utility of biomarkers and scores, I led an article published on the renowned "Blue Journal - AJRCCM" (1st author) validating the new definition of sepsis in community-acquired pneumonia and applying a clinical decision-making approach. It was one of the first papers to validate the score and first looking at its clinical utility. The paper has been cited, reproduced, and quoted in guidelines and international conferences.

My direct contribution to science has been substantial. My experience with translational research led an idea from the bench side to be tested in animal models, generating a hypothesis to be tested in a randomized trial (GRAVITY-VAP trial, Intensive Care Medicine, 2nd author). Using big data from Brazil and Spain, I could produce together with my collaborators impactful evidence on COVID-19 knowledge, particularly on the burden on the health system and vaccine effectiveness in Brazil. These articles were used to guide policies at the national level (Lancet Respiratory Medicine, 1st author) to worldwide, such as WHO emergency approval of inactivated vaccines (BMJ, 1st author) to the decision of which booster to use in those who received inactivated vaccines (Nature Comm, first author). Finally, I tried to understand the mechanism involved in COVID-19 severity by evaluating the role of air pollution in COVID-19 severity (Nature Comm, 1st author).

I aim to leverage on my extensive methodological knowledge and previous translational research experience combined with clinical-epidemiological background to foster my track record on reappraising pathophysiological and mechanistic features of respiratory infections, to advance the field of precision medicine particularly for severe pneumonia. I am going to characterize community- and hospital-acquired pneumonias, looking for clinical, microbiological, radiological, new biomarkers and inflammatory signatures. A main output will be the identification of phenotypes, combining host-pathogen interaction and the immune response, biomarkers and signatures, using machine learning clustering algorithms. Finally, to evaluate the diagnostic and predictive performance of new biomarkers, such as endothelial activation, in patients with respiratory infections. Overall, targeting to prospect and support randomized clinical trials looking for new diagnostic, prognostic and treatment tools.

My research is centred on utilising big data to assess disease mechanisms and provide real-world evidence. I integrate causal inference, exposome concepts, and advanced statistical methods into my work. I am highly committed to open science, creating public repository with shared code and data on github. I view science as a social construct essential for enhancing and promoting the health and well-being of individuals.

**Resumen del Currículum Vitae:**

I completed my medical degree (summa cum laude, 2008) and clinical training (2014) in Brazil. In 2015, I obtained a MSc in Epidemiology from the London School of Hygiene & Tropical Medicine, UK (LSHTM, Distinction) and, in 2018, my PhD from the University of São Paulo (USP) in collaboration with the LSHTM.

In 2016 I completed a Research Fellowship at the Hospital Clinic, Spain, followed by a postdoctoral position at the ISGlobal until 2021, when I was promoted to Assistant Professor. I have secured €266,405 from 1 competitive research grant (Wellcome Trust) and 2 fellowships (LTRF-ERS and Sara Borrell-ISCIII) as principal investigator (PI), and €630,000 from 3 competitive research and innovation funding calls that I have either coordinated (BR-EFFECT–Bill & Melinda Gates, ENIRRI-ERS) or led working packages (COVAIR-CAT-HEI).

I have experience on training young researchers including supervision of international young researchers from European and non-European countries. I have supervised 3 master theses; co-supervised 2 PhD theses and supervised 3 research fellows. Currently, I am supervising 1 PhD student (1st year) and co-supervising another 1 PhD student (4th year).

I have participated as a tribunal member of 4 PhD Thesis, 3 Master dissertations and 5 PhD thesis protocol. I am associated editor of Intensive Care Medicine (IF 38.9), the official journal of the European Society of Intensive Care Medicine (ESICM) and reviewer for more than 30 top-ranked journals, including NEJM, Lancet, BMJ, and Nature Commu, receiving a Recognition as Top Reviewer (Publons). I also participated in Grant Panels for the ESICM and UNAIDS.

My leadership skills and independence as a researcher are also illustrated by the fact that I have published 22 original peer-reviewed articles in a leader position (6 as last-author and 16 as corresponding author). Additionally, I have authored several editorials and commentaries in impactful avenues, such as The Lancet family. I have participated in international consortia and networks, including positions of coordination (ENIRRI, 19 countries) and chair of working groups (SOFA-2 group, 60 experts across six continents). I was invited to international conferences, including talks and oral presentations. I am familiar to collaborating with teams from diverse backgrounds in a multidisciplinary context, publishing with authors from 36 different countries. In 2023, I was listed among the Most Influential Researchers in 2022 in the Stanford list (doi: 10.17632/btchxktzyw.6).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | LORENZO MARTÍN, LUIS FRANCISCO |
| **Referencia:** | RYC2023-044678-I |
| **Correo Electrónico:** | lorenzolf90@gmail.com |
| **Título:** | Next-generation cellular models for ex vivo cancer research |

**Resumen de la Memoria:**

I graduated in Biotechnology with honors (Excellence Award) and the best academic record of my class at the University of Salamanca (2008-2013). I then pursued a Master's degree in Cancer Biology and Clinics at the University of Salamanca, where I received the Excellence Master's Award as the best academic record of my class (2013-2014). During this period, I secured 4 competitive research scholarships from the CSIC (Spanish National Research Council), AECC (Spanish Association Against Cancer), Ministry of Education and Science, and RTICC (Cooperative Research Thematic Network in Cancer).

After completing my Master's degree, I was awarded a contract from the FPU program of the Ministry of Education and Science. This enabled me to pursue a Ph.D. in Cancer Biology and Clinics and Translational Medicine (2014-2019) at the at the Centro de Investigación del Cáncer - Universidad de Salamanca. My doctoral research focused on the involvement of Rho GTPases exchange factors in the regulation of stemness and carcinogenesis in the squamous epithelium. I completed my Ph.D. with honors in 2019, receiving the Doctor Moraza Award for the best thesis in cancer research at the University of Salamanca. My doctoral work resulted in multiple research articles published in prestigious scientific journals such as Nature Communications and Cancer Cell.

After completing my doctorate, in 2020 I moved to the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, where I currently hold a postdoctoral research position. Here, my research involves the combination of tissue bioengineering, microfluidics technology, and advanced genomic tools to develop next-generation ex vivo tumorigenesis models of colorectal cancer. This innovative research has resulted in ground-breaking work, which is currently under second round of revision in Nature and Nature Biotechnology. In both of them, I hold a first and co-corresponding author positions.

During this period, I have begun establishing myself as an independent researcher, securing funding as a co-Principal Investigator (Swiss Cancer League, 375,000 CHF [~400,000 €]), gaining recognition as a co-corresponding author, supervising Master's degrees research projects, and performing extensive teaching activities at multiple universities.

**Resumen del Currículum Vitae:**

A. Scientific contributions
Publications: 27 (+2 in revision) (Q1: 28; Q2: 1. 1st author: 10; co-corresponding author: 4).
Total impact factor: 209 (average: 7.7/paper)
h index: 10
Research projects as (co-) Principal Investigator: 1 (375,000 CHF (~400,000 €). EPFL).

B. Mentorship
Direction of Master thesis: 2 (EPFL, Switzerland; UPO, Spain).
Direction of Bachelors research projects: 2 (EPFL, Switzerland).

C. Knowledge and technology transfer
Co-founder of 1 Research, Development, and Innovation (R&D&I) company.

D. Communication
International conferences: 6
National conferences (Spain): 7

E. Teaching (B: Bachelor. M: Master. P: practice. T: theory)
Universidad de Salamanca (Biochemistry and Cancer Biology): 325 hours (B & M. P & T)
Universidade da Coruña (Genomics and Bioinformatics): 630 hours (M. P)
École Polytechnique Fédérale de Lausanne (Bioengineering): 393 hours (B & M. P)
Universidad Internacional de Valencia (Genomics and Bioinformatics): 500 hours (M. P)

F. Teaching innovation projects
PID-ID2016/063 and PID-ID2017/178 (Universidad de Salamanca). Team member.

G. Awards
10 scientific and academic awards in total, 4 national, 1 regional, 5 university.

H. Scholarships
8 scholarships/grants in total, 6 national and 2 regional.

![Ministerio de Ciencia, Innovación y Universidades]
![Cofinanciado por la Unión Europea]
![Agencia Estatal de Investigación]

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

I. Accreditations
Profesor Ayudante Doctor, Profesor de Universidad Privada, Profesor Contratado Doctor (ANECA, Ministerio de Universidades)

*Please see CVA for additional details

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:**     **Biomedicina**
**Nombre:**     VALCARCEL JIMENEZ, LOREA
**Referencia:**     RYC2023-042567-I
**Correo Electrónico:**     lorea.valcarcel@gmail.com
**Título:**     DECIPHERING CELL-INTRINSIC AND EXTRINSIC TUMORIGENIC FACTORS IN PROSTATE AND RENAL CANCER

**Resumen de la Memoria:**

Throughout my career I have focused on one main aim: understanding how tumorigenesis occurs and how it leads to metastasis in different tumour types. Initially, during my PhD, I focused on deciphering the transcriptional reprogramming of metabolism and signalling during prostate cancer (PCa) progression and pathogenesis, and the molecular and cellular consequences underlying that regulation. Throughout the development of my thesis, I studied the role of the master transcriptional co-regulator PGC1A in PCa. This work enabled me to enrich my knowledge in cancer metabolism and to have a more comprehensive view of how the transcriptional program driven by PGC1A, sustaining oxidative mitochondrial metabolism, opposes cancer aggressiveness and metastatic dissemination. We were able to stablish correlations between gene signatures and the aggressiveness of the disease, being this of great relevance as a prognostic tool (Torrano V*, Valcarcel-Jimenez L*. et al., Nat Cell Biol.2016). Next, I aimed at studying how metabolic changes could impact on cell migration and invasion, together with cytoskeleton rearrangements as a need for tumour dissemination. This led me to the discovery of how the transcriptional axis activated by PGC1A/ERRA controls MYC-dependent migration and invasion ( Valcarcel-Jimenez L*, Macchia A*. et al Cancer Res 2019).

As I find fascinating the ability of cancer cells to switch their metabolic landscape to sustain tumorigenic events, I started my postdoctoral research in the University of Cambridge at the laboratory of Christian Frezza (later at the CECAD-University of Cologne), as they are experts on oncometabolism. As a postdoc, I independently developed my own research line using a model of mitochondrial dysfunction, from which I aimed at identifying novel oncogenic events of fumarate hydratase (FH)-deficient renal tumours. To do so, I carried out a genome wide CRISPR screen and studied the loss of different targets in FH-deficient cells. Importantly, we described the novel control of the oncogene MYC by a cell cycle regulator, HIRA, allowing an instrumental understanding of mechanisms of tumorigenesis in these tumours and the development of targeted treatments for patients (Valcarcel-Jimenez L et al. Science Advances 2022; Valcarcel-Jimenez L and Frezza C. Br.J.Cancer 2023). Moreover, we deciphered the metabolic requirements and plasticity that renal cancer cells developed during cancer progression (Sciacovelli M*, Dugourd A*, Valcarcel-Jimenez L et al. Nat Comm 2022). In this case, using a physiological media and in vitro and in vivo metastatic assays, we found molecular mechanisms responsible for metabolic flexibility during cancer progression in clear cell renal cancer cells.

As I was eager to have a wider and better understanding of tumour progression I am now focused on understanding the extrinsic events that happen through it. As a results, I am developing the analysis of the extracellular matrix (ECM), a main component of the tumour microenvironment and of the tumour itself, and the interactions of tumour cells with it during clear cell renal cell carcinoma progression. I believe this study would give rise to novel therapeutic interventions and patient stratification criteria.

**Resumen del Currículum Vitae:**

I am a biochemist and molecular biologist specialized in tumour biology, signalling, transcription and metabolism. I carried out my PhD in Biomedicine and Molecular biology at the CICbioGUNE, under the supervision of Dr. Arkaitz Carracedo. During my PhD I  performed two independent short stays in international centres. First, at the Kings College London, under the supervision of Dr. Victoria Sanz Moreno to study cell contractility and invasion in 3D systems. Second, at the University of Cambridge/MRC Cancer Unit under the direction of Prof. Christian Frezza, an expert in the oncometabolism field. These two stays were fundamental to establish novel collaborations and to develop my postdoctoral studies. In 2019, I started my postdoc at the MRC Cancer Unit with Prof. Christian Frezza as my mentor, and I finish it in the CECAD, University of Cologne. After a year from my return from abroad with a Juan de la Cierva incorporación contract, I am now a senior researcher at the University of the Basque Country, and I have just obtained my first project as principal investigator (CRIS contra el cáncer excelencia post-doc).

During my scientific career I have published 21 research articles (7 as first or co-first author, 4 of them as reviews and 1 as a co-corresponding author). Furthermore, both during my PhD and postdoctoral phases, as a results of my team work spirit, I have contributed to and collaborated in several publications. I have worked in 3 international and 3 national research centres, nurturing my scientific skills and independence. Moreover, I have presented my work as both oral and poster communications in international and national congresses. Importantly, throughout my career I have obtained several grants and contracts: PhD grant (Basque Government), 2 short stay grants (Basque Government and FEBS short-term fellowship, Posdoctoral (FEBS-long term fellowship, Juan de la cierva-incorporación), and several congress bursary awards (EACR 24th Conference, Manchester 2016 and EACR Cancer Metabolism meeting, Bilbao 2018).

During this time, I have co-supervised a master student at the University of Cambridge (MPhil candidate: Michael Xiao) with Prof. Christian Frezza and a visiting PhD student (Mikel Pujana) at the CECAD, University of Cologne. Moreover, I am currently co-supervising a PhD candidate (Álvaro Gonzalo Paulano) and an undergraduate student (Irati Lejona) during her end of degree project at the University of the Basque Country. Moreover, I have been giving seminars and workshops at the Biomedicine masters at the Faculties of Science and Technology and Medicine from the University of the Basque Country.

Finally, I have been very active in science dissemination activities and in showing the role of women in science. I have participated in public engagement activities, such as  the Cambridge Science Festival and led the activities for the European researchers night as part of the UPV/EHU . Moreover, I am fully committed with equality of gender in science and research. This is the reason why I joined the SRUK (Spanish Researcher in the UK organization)

women committee, and I have been giving seminars in schools as part of "Conócelas" (organized by ASEICA women committee) and I am a mentor in "Inspira" a programme aiming at promoting equality in STEAM careers.

**Área Temática:** **Biomedicina**
**Nombre:** FRONTERA , JIMENA LAURA
**Referencia:** RYC2023-042568-I
**Correo Electrónico:** frontjimena@gmail.com
**Título:** Neural circuits of emotional learning and memory

**Resumen de la Memoria:**

SCIENTIFIC AND TECHNICAL CONTRIBUTIONS
1. Frontera JL, et al. Nature Communications.2023.
2. Frontera JL, et al. Nature Communications. 2020.
3. Frontera JL, Léna C. Neuron. 2021.
4. Frontera JL, et al. Neuropharmacology. 2018.
5. Coutant B, Frontera JL, et al. Nature Communications. 2022.
6. Bossi S, Dhanasobhon D, Ellis-Davies G, Frontera JL, et al. Neuron. 2022.
7. Baba Aïssa H, Sala RW, Georgescu Margarint EL, Frontera JL, et al. eLife. 2022.
8. Cervino AS, Paz DA, Frontera JL. Developmental Neurobiology. 2017.
9. Editorial Function as Guest Associate Editor in Frontiers in Systems Neuroscience.
10. Neuroscience conferences: invited speaker in 2 symposiums, at the international Gordon Research Conference (GRC) 2019 in Switzerland, and the University Hospital Essen in Germany.

INTERNATIONALIZATION AND MOBILITY
1. International Master in Biomedical Sciences, program between the University of Buenos Aires (UBA, Argentine) and the University of Freiburg (Germany). DAAD (German Academic Exchange Service) scholarship to study and perform an internship in the laboratory of Animal Developmental Biology under supervision of the Prof. Dr. Annette Neubüser at the University of Freiburg in Germany, for 6 months.
2. Master and PhD thesis work in the laboratory of Prof. Dr. Dante Paz at the Institute of Physiology, Molecular Biology and Neurosciences (IFIBYNE, UBA-CONICET), Buenos Aires, obtaining two different competitive PhD fellowships (UBA and CONICET).
3. From April 2015 to May 2016: first postdoctoral training in the laboratory of the Prof. Dr. Alicia Brusco in the Institute of Cellular biology and Neurosciences (IBCN, UBA-CONICET), Buenos Aires. Postdoctoral fellowship from CONICET.
4. From June 2016 to May 2022 (6 years): Second postdoc in the laboratory of Dr. Daniela Popa and Dr. Clément Léna of Neurophysiology of brain circuits at the Institute of Biology of the Ecole Normale Supérieure, in Paris.
5. From June 2022 to December 2023: I joined the laboratory of Dr. Uwe Maskos of Integrative Neurobiology of Cholinergic systems at Institut Pasteur, Paris.
6. In January 2024: I joined the Department of Medicine and Life Science as postdoctoral researcher, at Universitat Pompeu Fabra, Barcelona.
7. Participation in numerous international conferences and seminars, providing poster presentations, oral communications and invited talks.

INDEPENDENCE AND LEADERSHIP
1. Capacity to independently obtain competitive funding as Principal Investigator from the " Agence Nationale de la Recherche" (ANR).
2. Co-direction of two master thesis work, supervision of several master students, summer interns and co-supervision of a PhD student.
3. Corresponding authorship of a master student work demonstrates my ability to lead and supervise research projects to completion (Cervino et al., Developmental Neurobiology 2017).
4. Participation in several competitive projects as part of the research team and as collaborator.

LINE OF RESEARCH TO BE DEVELOPED
Cerebellar contribution to emotional learning and memories.
The focus of my research work during the following years will be the identification of the neural circuits and mechanisms involved in emotional learning and memories, and the contribution of the cerebellum to these processes and associated psychiatric disorders.

**Resumen del Currículum Vitae:**

I have a long-standing interest in neuroscience, which began during my undergraduate studies in Biology at the University of Buenos Aires (UBA, Argentina). After getting my degree, I got a DAAD  scholarship to perform an international Master in Biomedical Sciences (program between the UBA and the University of Freiburg, Germany). During my PhD in neuroscience in the laboratory of Prof. Dr. Dante Paz (IFIBYNE, UBA-CONICET), I got two competitive PhD fellowships to study the cellular mechanisms involved in neurogenesis and neural differentiation in the olfactory epithelium. These results were published in peer-reviewed journals (Frontera et al., Annals of Anatomy 2015; Frontera et al., Journal of Chemical Neuroanatomy 2016), and I assisted the direction of a master student (Cervino et al., Developmental Neurobiology 2017).
Between 2013 and 2016, I carried out several teaching activities for the Physiology and Molecular Biology Department at the UBA, the Master in Psychoneuropharmacology at Favaloro University, and at the University Caece, Buenos Aires, Argentine.
From my first postdoctoral training, I have focused my research on understanding the circuits and mechanisms underlying learning, memory and behavior, especially those related to emotions. In 2015, I obtained the CONICET postdoctoral fellowship to study the interactions between the endocannabinoid system and the dopamine and serotonin systems in the laboratory of Prof. Dr. Alicia Brusco (IBCN, UBA-CONICET). This study was published in a peer-reviewed journal (Frontera et al., Neuropharmacology 2018). During this period, I also co-directed a master's thesis work.

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From June 2016 to May 2022, I joined the team of Dr. Daniela Popa and Dr. Clement Lena at Institut de Biologie de l' Ecole Normale Supérieure in Paris, for my second postdoc, where I continued expanding my knowledge in cognitive processes such as emotional learning and fear memories, and the contribution of the cerebellum to the limbic system. During this period, I participated in several projects. My main research described novel pathways linking the cerebellum to the anxiety and fear network (Frontera et al., Nature Communications 2020; Frontera et al., Nature Communications 2023). I also contributed to other research lines (Coutant et al., Nature Communications 2022; Baba Aïssa et al., eLife 2022), collaborated with other laboratories (Bossi et al., Neuron 2022), and published a preview article (Frontera and Lena, Neuron 2021).

I have also supervised several students, participated in several international conferences and awarded with the prize to the best poster at the Conference of University of London. In 2022, I obtained a grant for young researchers from the Agence National de la Recherche (ANR), France.

From June 2022 to December 2023, I joined as a postdoctoral researcher the team of Dr. Uwe Maskos at Institut Pasteur in Paris, to study the contribution of the nicotinic acetylcholine receptors in cognitive processes and their implication in Schizophrenia and Alzheimer' s disease. The results from this work are in preparation to be published. I also participated as editorial board member in Frontiers in Systems of Neurosciences.

In January 2024, I have joined the Medicine and Live Sciences Department at the University Pompeu Fabra in Barcelona, where I continue doing research and carry out teaching activities.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | AYDILLO GÓMEZ, TERESA ALLENDE |
| **Referencia:** | RYC2023-045143-I |
| **Correo Electrónico:** | teresa.aydillo@gmail.com |
| **Título:** | Deciphering Immunological Imprinting after Human Infection and VAccination (DIIVA) |

**Resumen de la Memoria:**

I'm an enthusiastic scientist with more than 10 years of research experience on biomedical research, with a particular interest on immunology and therapeutic approaches of emerging infectious diseases. I have maintained a disciplinary identity as a human virologist but also engaged extensively on basic virology, epidemiology of viral diseases, human immunology and vaccinology. Most of my past and ongoing research has been oriented to study the molecular pathogenesis and host responses of emerging or re-emerging viruses like influenza and SARS-CoV-2 to provide real-time evidence-based data that can inform current and future prevention strategies, clinical management and decision-making process on epidemic and pandemic outbreaks. I apply a global and multidisciplinary approach, from basic research to characterization of immune responses after infection/vaccination, and systems biology in two different but complementary research topics: influenza and SARS-CoV-2.

I am at the present Faculty at the Department of Microbiology, Global Health and Emerging Pathogens Institute, ISMMS (NY, US). As an Assistant Professor, I've been dedicated to studying emerging viruses like influenza and SARS-CoV-2. For this, I designed a unique multidisciplinary research plan to understand factors of virus pathogenicity and host immune responses. I am particularly interested in three research questions:

1. What are the virus determinants of pathogenicity and transmission? For this I characterize the main virological factors that correlate with severe disease, immune escape or vaccine failure.

2. What are the main host correlates of protection of influenza and COVID-19? For this I study the influence of pre-existing immunity, age and other host and non-host related factors on susceptibility to influenza and SARS-CoV-2; and the protective potential of strain-specific or cross-reactive immune responses upon infection with viruses at both the mucosal and systemic compartments.

3. How immunity evolves after repeated exposures through infection and vaccination? For this I study the dynamics and induction of surrogates of protection in the context of single or repeated rounds of influenza or SARS-CoV-2 exposure.

For this particular call, I propose to use banked human biological samples from longitudinal human cohort studies of influenza and COVID-19 and implement a pipeline for high-throughput analysis of antibodies and antigen-specific B cell responses to define the antibody and B cell repertoire that correlates with clinical and epidemiological features. As a second step, we will identify and generate antigen-specific cross-reactive antibodies against SARS-CoV-2 and other HCoVs with pathogenic potential by antigenic cartography.

**Resumen del Currículum Vitae:**

I'm an enthusiastic scientist with more than 10 years of research experience on biomedical research, with a particular interest on immunology and therapeutic approaches of emerging infectious diseases. I maintained a disciplinary identity as a human virologist but also engaged extensively on basic virology, epidemiology of viral diseases, human immunology and vaccinology. I apply a global and multidisciplinary approach, from basic research to characterization of immune responses after infection/vaccination, and systems biology in two different but complementary research topics: influenza and SARS-CoV-2. I am author of 42 original contributions, 18 as a first, second or last/corresponding author.

I am at the present Faculty at the Department of Microbiology, Global Health and Emerging Pathogens Institute, ISMMS (NY, US). As an Assistant Professor, I've been dedicated to studying immune response to emerging viruses like influenza and SARS-CoV-2.

I study the dynamics and induction of surrogates of protection in the context of single or repeated rounds of influenza or SARS-CoV-2 exposure though infection and vaccination. I integrate high dimensional clinical and epidemiological data together with basic virology and immune responses. Examples of generated data from these studies include more than 22 published manuscripts since 2020, 11 as a first, second or last/corresponding author in journals like New England Journal of Medicine, Cell Reports Medicine, Cell Host Microbe, Nature Communications, NPJ Vaccines, Emerging Microbes and Infection or iScience. These results have allowed me to get my own funding in USA: as a Co-Principal Investigator/Project Leader at the Center for Research on Influenza Pathogenesis and Transmission (CRIPT) ($113,000/year, 7 years); and as Principal Investigator to understand cross-reactive immune responses in COVID19 (American Lung Association awarded in July 2023, $100,000/year, 2 years). Additionally, another grant is pending of resolution (Pilot Project to the Center for Research on Influenza Pathogenesis and Transmission -CRIPT, $422,500 for 2 years). Besides I'm Co-Lead and Co-Investigator of a series on projects funded by NIH: Sinai-Emory Collaborative Influenza Vaccine Innovation Centers (SEM-CIVIC); NIH Research Project Grant (U19) SYBIL; and Viral Immunity and VAccination (VIVA) Human Immunology Project Consortium (HIPC).

Besides, I am peer-reviewer of journals such as NEJM, Journal of Infectious Diseases, Scientific Reports or Communications Medicines. I participated in more than 20 national and international scientific meetings, including invitations as speaker; and I have been cited at least 4600 times by other researchers in my field. I have a total accumulated impact factor of 453 (average impact factor: 11 per publication) and an H index 25.

I am also very committed to graduate education and mentoring. I have mentored in the past MSc, BSc and also PhD students in Spain, but also at my current position withing the Icahn School of Medicine at Mount Sinai. I'm Co-Director of 3 Thesis, one has been recently defended at the University of Valladolid (July 14, 2023), the second will be defended in 2024 at the Mount Sinai School of Medicine; and the third has been registered in the University of Burgos in 2023. Besides, I acted as a Mentor in the Virology Master from the University Complutense of Madrid.

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**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ARIZA VEGUILLAS, ADRIANA |
| **Referencia:** | RYC2023-044231-I |
| **Correo Electrónico:** | adriana.ariza@ibima.eu |
| **Título:** | Optimization of the diagnosis and treatment of allergic diseases |

**Resumen de la Memoria:**

Dr Ariza obtained her Biology degree at Universidad de Málaga in 2007. Then, she started her PhD in IBIMA, in the "Allergic Diseases to Drugs and Allergens" supported by "PFIS" (ISCIII). She worked on the identification and characterization of antigenic determinants and carrier molecules involved in allergic reactions to betalactam antibiotics, and she acquired experimental skills in immunoassay, cellular culture, fluorescence microscopy and flow cytometry. During her PhD, she joined to Dr. Pérez-Sala¿s group (CIB, Madrid) to acquire skills in proteomic techniques. Moreover, in 2012 she started collaboration with Prof. G Aldini from Università degli Studi di Milano (Italy) for applying high resolution mass spectrometric strategies in the identification and characterization of human serum albumin covalently adducted by drugs. In 2013, she defended her PhD thesis entitles "Allergic reactions to beta-lactam antibiotics: identification and characterization of antigenic determinants and carrier proteins".

After her PhD, she continued working in the "Allergic Diseases to Drugs and Allergens" research group. She led as principal investigator the research projects "Development of dendrimeric nanostructured materials with potential applications in the diagnosis of drug allergies: immunoassays and cell activation test" (PI-0699-2011) and "Development of nanostructures for the design of biological vesicles with anti-inflammatory and immunosuppressive activities" (PI15/00898).

From June 2015 to March 2017 she made a postdoctoral stay at the University of Liverpool (United Kingdom) (TAHUB/II-004) to developed the project "Application of a cellular model to analyze the immune recognition of different betalactam determinants in IgE and T-cell mediated allergic reactions" and she acquired new experimental skills focused on cellular cultures, generation of drug-specific T-cell clones and immunological and functional characterization of T-cells, and mass spectrometry.

From 2018 to 2020 she held a postdoctoral contract "Sara Borrell Fellowship" (ISCIII) for working on the evaluation of the immunological mechanisms involved after the administration of specific immunotherapy to patients with local allergic rhinitis and on the study of the role of the innate immune system in the development of non-steroidal anti-inflammatory drugs-exacerbated respiratory diseases.

Finally, since 2021 she holds a senior postdoctoral contract funded by Junta de Andalucía to work on the research line "Optimization of the diagnosis and treatment of allergic diseases" (RH-0099-2020). In addition, she is the principal investigator of two research project in progress: "Diagnostic approach for allergic patients to betalactam antibiotics through the optimization of the basophil activation test, deepening of the mechanisms involved in basophil degranulation and passive sensitization" (PI-0127-2020) and "Endophenotypic and prognostic biomarkers in hypersensitivity reactions to chemotherapy. Risk management of controlled administration and desensitization" (PI22/01119). For that, Dr. Ariza is developing a research line focused on the optimization of the diagnosis and treatment of immediate drug hypersensitivity reactions supported by this projects in progress.

**Resumen del Currículum Vitae:**

Dr. Adriana Ariza holds a Biology Degree (2007) (degree award "Diario El País", Universidad de Málaga) and PhD (2013) (extraordinary doctorate award) by Universidad de Málaga. She completed her thesis "Allergic reactions to beta-lactam antibiotics: identification and characterization of antigenic determinants and carrier proteins" in IBIMA (Málaga, Spain) supported by PFIS fellowship (ISCIII) (FI08/00385). After her PhD, Dr. Ariza led as principal investigator the projects "Development of dendrimeric nanostructured materials with potential applications in the diagnosis of drug allergies: immunoassays and cell activation test" (PI-0699-2011, €39.934) and "Development of nanostructures for the design of biological vesicles with anti-inflammatory and immunosuppressive activities" (PI15/00898, €92.565).

From 2015 to 2017 she carried out a postdoctoral stay at the University of Liverpool (United Kingdom) to develop the project "Application of a cellular model to analyze de immune recognition of different betalactam determinants in IgE and T-cell mediated allergic reactions". The stay and was supported by the mobility program "Andalucia Talent Hub" (co-funded by Junta de Andalucía and European Union¿s VII Framework Program of the European Commission via the Marie Curie Action) (TAHUB/II-004) (€159.588,45, including €15.061,06 for research expenses).

In 2018, Dr. Ariza obtained "Sara Borrell" postdoctoral contract from ISCIII (CD17/00146) to work on the evaluation of the immunological mechanisms involved after the administration of specific immunotherapy to patients with local allergic rhinitis.

Finally, since 2021 she holds a senior postdoctoral contract funded by Junta de Andalucía to work on the research line "Optimization of the diagnosis and treatment of allergic diseases" (RH-0099-2020). In addition, she is the principal investigator of two research project in progress: "Diagnostic approach for allergic patients to betalactam antibiotics through the optimization of the basophil activation test, deepening of the mechanisms involved in basophil degranulation and passive sensitization" (PI-0127-2020, €106.900, Junta de Andalucía) and "Endophenotypic and prognostic biomarkers in hypersensitivity reactions to chemotherapy. Risk management of controlled administration and desensitization" (PI22/01119, €93.170, ISCIII).

Since 2008, she has published 64 JRC articles (total citations: 1830; 43 Q1 publications (23 of them D1 publications); H-index: 26) and 2 book chapters. She has sent more than 90 communications to national and international congresses. She has participated in 20 research projects (principal investigator in 4 of them), and 2 clinical trials (2015-002105-11, CLOU064112201). She is author of 2 patents (ES201400333, PCT/ES2017/070588). She is a member of the Network of Inflammatory Disease (RICORS, ISCIII, RD21/0002/0008), the research group in Asthma and Allergy (PAIDI, CTS-1030) and the European Network of Drug Allergy. She is accredited as PhD lecturer by ANECA and she has obtained R3 certificate by Agencia Estatal de Investigación. She is supervisor of final degree projects and junior research programs and reviewer for Frontiers in Pharmacology and Allergy.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | PAIVA , BRUNO |
| **Referencia:** | RYC2023-044628-I |
| **Correo Electrónico:** | bpaiva@unav.es |
| **Título:** | Oligoclonal B and plasma cell expansions vs circulating tumor cells: physiological process with aging vs consequential disease |

**Resumen de la Memoria:**

The previous 16 years of research in the field of monoclonal gammopathies led me to the following hypothesis: the presence of oligoclonal B cell and plasma cell (PC) expansions with consequent detection of monoclonal immunoglobulins might be a physiological process with aging, whereas the presence of circulating tumor cells (CTCs) might represent the earliest sign of tumor expansion and metastasis and, therefore, of consequential disease. We will investigate this hypothesis in the three different projects described in the document attached: NoMoreMGUS, iMMunocell and BloodFlow.

NoMoreMGUS/iMMunocell: We will develop new minimally invasive methods for the differential diagnosis between the majority of MGUS and SMM patients with benign disease vs the few with a premalignant tumor. For this, we will generate a large clinical dataset and will analyze blood from 5000 MGUS and 300 SMM patients periodically during years. We believe that the unequivocal identification of the risk of each individual patient will result in new diagnostic criteria, facilitate early interception, avoid end-organ damage and increase cure rates.

BloodFlow: Assessment of treatment efficacy is mandatory in cancer and complete remission is the endpoint of treatment for many patients. However, unfortunately, it does not mean cure and most individuals will inevitably relapse, develop refractoriness to all available drugs, and die from their tumor. This is no longer acceptable. In patients with blood cancer, the problem is that response assessment is usually performed in samples that require invasive procedures, cannot be repeated periodically, and thereby lack sufficient clinically utility. The solution we propose is to monitor tumor kinetics in peripheral blood with the appropriate frequency, using the new ultra-sensitive methods that we aim to develop in this project.

**Resumen del Currículum Vitae:**

I joined the Hematology Department of the University Hospital of Salamanca has a PhD student in June 24th 2007. In 2011, at age 27, I finalized my PhD on the clinical significance of flow cytometry immunophenotyping in multiple myeloma and continued investigating in this disease as PhD in the Instituto de Investigación Biomédica de Salamanca and Centro de Investigación del Cancer in Salamanca until 2013. In 2013, I joined the Hematology Department of Clinica Universidad de Navarra as research fellow. In 2014, I was appointed Director of Flow Cytometry and Scientific Coordinator of the Hemato-Oncology diagnostic laboratories of our University. In 2019, I was appointed Director of the Monoclonal Gammopathies research laboratory in CIMA Universidad de Navarra.

With nearly 17 years of research career, I have authorship in >200 publications, being first author in >40, last author and/or corresponding author in >30. Among them, there are several publications in the top journals such as the N Engl J Med, Nat Med, Cancer Cell, Lancet Oncol and J Clin Oncol, with impressive numbers in the most important Journal in Hematology: Blood (>35). More than 95% of the publications are in the Q1 of their respective specialty. At age 40, my h index is >50, with more than 10,000 citations (without self-citations) and an average of >70 citations per publication. I have been PI or Co-PI in >20 R&D projects funded through competitive calls of public or private entities. I received numerous awards, including the Bart Barlogie Young Investigator Award for outstanding research developed in multiple myeloma, The 2015 Future Leaders in Hematology Award for Clinical Research in Hematology, and the Brian GM Durie Outstanding Achievement Award in 2022. I am a frequent invited speaker in the most relevant international conferences in the fields of Hematology and Flow Cytometry (~30/year). I have trained numerous flow cytometry users and investigators from around the World, and have directed >6 PhD thesis.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | AGUILERA LIZARRAGA, JAVIER |
| **Referencia:** | RYC2023-043009-I |
| **Correo Electrónico:** | javi.aguilera89@gmail.com |
| **Título:** | PhD |

**Resumen de la Memoria:**

I am a senior postdoctoral researcher at the University of Cambridge (United Kingdom, UK), with 12 years of international research experience in biomedical sciences between Spain, Belgium and the UK. My research interest lies in advancing our understanding of the molecular and cellular mechanisms underlying (chronic) visceral pain. This type of pain relates to pain arising from the internal organs and affects >20% of the global population. Recent evidence has highlighted the role of immune activation, especially involving mast cells, as a key mechanism in the development of chronic visceral pain. In previous studies, my team and I demonstrated that the breakdown of local (intestinal) food tolerance to dietary proteins, induced by an enteric infection or bacterial toxins, can lead to long-lasting activation of mucosal mast cells and cause visceral pain. However, a significant challenge persists in identifying other specific triggers that disrupt the intestinal immune system leading to dysregulated visceral pain signalling. Thus, I am interested in delving into neuro-immune mechanisms leading to the development of visceral pain upon ingestion of immunogenic food compounds and related constituents (additives and metals).

Importantly, the clinical presentation of chronic visceral pain is typically blurred by concomitant symptoms such as abdominal distension, diarrhoea and/or constipation. This suggests that certain mechanisms might overlap with those of its comorbidities, which could explain the complex clinical presentation of visceral pain. Specifically, aberrant pain-sensing neuron activation might not only be linked to the development of chronic pain but also to its associated symptoms by modulating the intestinal microenvironment. However, the mechanisms underlying the interaction between sensory neurons and the intestinal mucosa remain poorly understood. I am interested in exploring the role and consequences of the activation of gut-innervating pain-sensing neurons in the modulation of the intestinal mucosa (patho)physiology. I have generated exciting data demonstrating that activation of transient receptor potential (TRP) ion channels in gut-innervating pain-sensing neurons can modulate mucosal ion transport in the intestine, therefore potentially contributing to the pathophysiology of diarrhoea-associated conditions. Consequently, I aim to explore the mechanisms underlying the crosstalk between intestinal pain-sensing neurons, epithelial cells and intrinsic enteric neurons to stimulate the expulsion of noxious agents from the gut through secretory processes.

The main innovation and distinction of my research is to investigate pain as a bidirectional process. Therefore, my research programme has the potential to characterise the mechanisms underlying (chronic) visceral pain (which is an important unmet clinical need) as well as those of the concomitant symptoms observed in these patients.

**Resumen del Currículum Vitae:**

My scientific production includes an interdisciplinary track-record of 18 articles in top well-respected scientific journals (plus one recently uploaded to bioRxiv), multiple research awards/recognitions at international symposia and 12 international conference proceedings (2 of them as a Faculty member). Notably, my research has been published in journals specific to my field (i.e., gastroenterology) as well as in high-impact journals of broad scientific interest, such as Nature, Cell and Nature Reviews Immunology.

I have already obtained funding as a principal investigator to lead and develop my own projects (Research Grant from the Pain Relief Foundation, UK; awarded £20,556). Moreover, I am also co-promoter of a Fundamental Research Senior project by the Flanders Fund for Scientific Research (Belgium; awarded €520,000). Importantly, I conceptualised and designed a project for a PhD thesis, for which I am the co-promoter of the PhD student (María Cuende Estévez, KU Leuven). Furthermore, I have demonstrated my ability to generate and execute research projects independently, as evidenced by CV.

Of interest, I have gained research experience in various countries, including Spain, Belgium and the United Kingdom. As a result, I have developed an exceptional network of international collaborators at institutions such as the KU Leuven (Belgium), University of Cambridge (UK), King's College London (UK), Queen's University (Canada), Mayo Clinic (United States) and Medical University of Vienna (Austria).

I am supervising a PhD student (thesis co-promoter) at the KU Leuven and have supervised the Research Project of undergraduate students (at KU Leuven and the University of Cambridge). Furthermore, I have supervised/tutored the course of Pharmacology at the University of Cambridge (academic courses 2022/2023 & 2023/2024). Additionally, I have lectured trainings programmes at the University of Cambridge to visiting students (organised by IN ThoughtBridge Co, Shanghai, China) and at the Yale School of Medicine (United States).

Notably, I was chair of a session during the EFIC conference 2023 and I am a member of the review boards of several journals (Gut Microbes, British Journal of Pharmacology, EBioMecidine, Frontiers Immunology, Frontiers in Genetics, Frontiers in Cellular and Infection Microbiology and Journal of Pain Research).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ARANDA CLEMENTE, CARLOS JOSÉ |
| **Referencia:** | RYC2023-043687-I |
| **Correo Electrónico:** | cjarandaclemente@gmail.com |
| **Título:** | From basic IBD research to translational research in atopic diseases: a journey through mucosal immunology |

**Resumen de la Memoria:**

During my PhD phase I worked in 3 main areas related to the mucosal immunology of the gut under the direction of Olga Martínez and Fermín Sánchez de Medina as part of the CTS Group CTS-235 "Grasas insaturadas y nucleótidos. Implicaciones terapéuticas". Namely: microbiota and barrier function in experimental models of colitis, the effect of calprotectin as a therapeutic agent in mouse models of colitis, the effect of functional food on the intestinal epithelial barrier function, and the role of the glucocorticoid receptor in the intestinal epithelia (my thesis topic).
In March 2017, I defended my PhD with the thesis entitled 'Role of the glucocorticoid receptor NR3C1 in the intestinal epithelium', awarded Sobresaliente Cum Laude (highest grade). Later that summer, I was awarded a Ramón Areces Fellowship for my postdoctoral international stay.

For my postdoc, I joined Maria Lafaille's Laboratory at New York University (later moved to Mount Sinai) in June 2017 to study B cell immunology in different atopic-related diseases (asthma, atopic dermatitis, and food allergies). In the first year I worked in Dr. Lafaille's grants on mice B cell biology, using state-of-the-art technologies to unravel IgE cells biology. Later I moved into a more translational part of the lab working in humans. I took the lead of Dr. Lafaille grant R21AI133076, The origin and memory of human IgE responses. We identified a population of IgG memory B cells that differentially expressed CD23/FCER2, IL4R, and IL13RA1, indicating a history of differentiation during type 2 immune response. Type 2-marked IgG memory B cell numbers were found to be increased in atopic subjects, and importantly, their frequency correlated with levels of circulating IgE, suggesting a developmental link.

I returned to Spain in 2022 with a Sara Borrell fellowship to join the laboratory of Allergic Diseases to Drugs and Allergens leaded by Dr. Torres and Dr. Mayorga in the Instituto de Investigación Biomédica de Málaga y Plataforma en Nanomedicina (IBIMA Plataforma BIONAND). Since then, I have gained more independence, and I am leading several branches of the lab as a senior postdoc. I have been awarded a MSCA Postdoctoral Individual Fellowship (HORIZON-MSCA-2022-PF-EF). The proposal was awarded with a score of 97% and a duration of 24 months (budget 181,152.96€) with a novel research topic titled "Understanding the role of B cell phenotypes as a predictor of the efficacy and prognosis of allergen immunotherapy using allergic rhinitis to house dust mite as a model".

In 2023 I submitted my first project as a PI to the ISCIII, which was awarded 246,250 € for 3 years. This project aims to understand the B cell biology of patients with systemic or local allergic rhinitis as well as how comorbidities by asthma can affect the T and B cell immune compartment.

In terms of teaching experience, I have taught 180 ECTS credits in three university degrees. I co-directed the Master Thesis of Diana Diaby. I have co-tutored 3 TFGs and 2 studenst from the FP for tissue culture specialization during the internship in a laboratory. I have been member of one thesis committee. I am co-directing two PhD students.

I have a very complete profile for researching in allergies, from aeroallergens to food or drug allergies, together with research in biomarkers, diagnostic tools and molecular bases of the diesease.

**Resumen del Currículum Vitae:**

I defended my PhD in 2017, I have been recognized as "Profesor Contratado Doctor" by ANECA, my H-index is 12 (13 in Google Scholar) and my publications have been cited 600 times (895 G- Scholar). I have 1 patent and 28 articles (only 5 as reviews), 26 of them in Q1 (50% in D1), 9 as first author, 3 as last, and 2 as corresponding. 4 of my publications are in the Allergy journal, first of its category (one as first and corresponding, one as co-senior, and another one as corresponding).

I am also co-author of 2 books chapters (in press). The first one in the 4th edition of the Tratado de Nutrición, a reference in the field, with the title "Bases moleculares de la modulación del sistema inmunológico por nutrientes". The second one is in the Encyclopedia of Food Allergy, chapter titled "Alternative In vitro Methods for Allergenicity Risk Assessment."
My scientific path has been on an upward trajectory, been able to have concatenated fellowships during my whole career and leading me to an independent role obtaining my first grant as PI this last year and directing PhD students.

Throughout my career, I have obtained several research fellowships. As an undergraduate student, I obtained a CSIC JAE-intro (2010), the "Beca de Iniciación" (2010), and the "Beca de colaboración" (2011). I obtained a FPU fellowship (2013) for my Ph.D. at the University of Granada.

I have been part of seven competitive projects, both national and international, and one collaboration with the industry. During my PhD I was part of the project BFU2014-57736-P by the Ministerio de Economia y Competitividad (MINECO) with Fermín Sánchez de Medina as a PI. The direct data produced in my PhD have provided the basis to obtain two Spanish grants funded by MICINN (PID2020-120140RB-I00 2018, PID2020-120140RB-I00 2021) and one by the Instituto de Salud Carlos III (ISCIII) (PI21/00952).

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**Turno General**

After my Ph.D. in Defense in 2017, I was awarded a Ramón Areces fellowship. Working in Dr.Lafaille lab allowed me to internationally participate in four different grants awarded by the NIH (1R21AI133076, 1R01AI130343, 1R01AI151707, and R01AI153708). The preliminary data produced by my research was used by Dr. Lafaille and Dr. Berin for an R01 Grant awarded by the NIH for $2.300.000 in food allergy immune mechanisms.

In 2021, I obtained a Sara Borrell, a competitive program for postdoctoral fellowships in health sciences. I obtained the "Plan Propio" grant from IBMA allowing me to independently obtain preliminary data for my MSCA proposal. In 2022 I was awarded a Marie Skodowska-Curie Actions MSCA Postdoctoral Individual Fellowship. The proposal got a score of 97% and a duration of 24 months with a novel research topic titled "Understanding the role of B cell phenotypes as a predictor of the efficacy and prognosis of allergen immunotherapy using allergic rhinitis to house dust mite as a model". In 2023 I submitted my first project as a PI to the ISCIII, which was awarded 246,250 € for 3 years, including budget for a technician (PI23/01516).

To conclude, I believe that my background, leadership, and dedication to allergic diseases are essential features to pursue my goal to become an independent and recognized research group leader. Ramon y Cajal fellowship will make a difference towards my professional ambition in establishing myself as a leader in the new frontiers of allergy knowledge.

**Resumen de la Memoria:**

I am a highly experienced biomedical researcher with a strong background in the design and development of new radiopharmaceuticals for diagnostic and therapeutic applications. I have spent the majority of my academic years in the United Kingdom, having carried out my final-year MSc project at Imperial College London (2011), both my MRes and PhD theses at King' s College London (2012-2017), and my early postdoctoral training at the University of Oxford (2016-2019). I returned to Spain in 2019 after obtaining a competititive PERIS fellowship for young researchers and have remained at Vall d'Hebron Research Institute where I started a new research line in design and development of immuno-PET radiopharmaceuticals for cancer management, after securing independent funding from La Caixa Foundation and Radboudumc (Nijmegen,The Netherlands). So far I have applied my 9-year professional experience in molecular imaging in neurodegenerative diseases (Alzheimer' s, Parkinson' s, Niemann-Pick disease and multiple sclerosis), oncology (breast, lung, prostate, brain and pancreatic cancer), inflammatory diseases (ulcerative colitis and Crohn's disease) and metabolic disorders (type 2 diabetes and nonalcoholic fatty liver disease). If granted this contract, my future plans involve applying my skills and expertise in the molecular imaging field, and specifically in immunoPET probe design, to a crucial research application: the optimization of immunotherapies. Immunotherapies are revolutionising the treatment of many cancers and inflammatory diseases. However, this type of treatment is not always successful due to the diversity of the tumour-immune microenvironment and/or the gradual adaptation of the tumour and metastatic sites to the immune response. Thus, there is an urgent clinical need for diagnostic methods to assess the immune status of individual patients prior to treatment as well as regularly monitor therapeutic response. My aim is to develop the next generation of nuclear imaging-based immunotracers to monitor the trafficking of specific subpopulations of immune cells with the goal of improving the management and development of current and future immunotherapy strategies for cancer. In particular, I intend to focus on the development of highly-specific immuno-PET imaging agents for longitudinal tracking of natural killer (NK) and dendritic cells (DC), two crucial cell populations in the immune response to cancer for which there are currently no tracking tools. On the other hand, I will evaluate ZIP4 and other proteins associated with trace metal metabolism as diagnostic imaging and theragnostic biomarkers in order to generate new immunoPET probes that improve the management of pancreatic cancer and other cancers with similar characteristics.

**Resumen del Currículum Vitae:**

I am a radiochemist with a keen interest in biomedicine and a strong background in the medical imaging field. My main research interests include the design and development of new radionuclide-based molecular imaging tools for early detection of disease, and discovery and validation of biomarkers for diagnostic and therapeutic management of cancer, inflammatory diseases and neurodegeneration. My educational background is highly interdisciplinary and includes experience in synthetic chemistry, radiochemistry, molecular biology, in vivo disease models and preclinical imaging (PET, SPECT, CT and MRI). I completed my MSc in Chemistry at the University of Barcelona in 2011 after carrying out my final-year project at Imperial College London. I subsequently undertook a master in research (MRes) in medical imaging sciences at King' s College London. Following this, I went on to pursue a PhD in imaging chemistry and biology at King' s College London. My PhD project focused on the use of 64Cu-PET to study copper trafficking abnormalities in neurodegenerative diseases and the evaluation of their diagnostic potential. This work resulted in 12 scientific articles, all of them published in Q1 molecular imaging journals, and 10 presentations at both national (UK) and international conferences. Moreover, my scientific article " PET imaging of copper trafficking in a mouse model of Alzheimer' s disease" was granted a prestigious Alavi-Mandell publication award in 2017. After completing my PhD, I took up a position as a postdoctoral researcher at the University of Oxford to develop antibody and peptide-based early-stage diagnostics for pancreatic cancer. In that first postdoctoral position, I authored 11 scientific publications and a patent, and presented my work at 12 scientific conferences. In addition to my role as a postdoctoral researcher, I also acted as the lead radiation protection supervisor at Oxford' s Radiobiology Research Institute from 2017 to 2019. This role allowed me to supervise the set-up of a new radiochemistry laboratory at the Oxford Institute for Radiation Oncology in 2019. During my postdoc years, I also acted as the leading in vivo technical trainer and trained junior and senior group members on animal model development, animal handling and design and execution of preclinical imaging studies. For this work I received an Award for Excellence from the University of Oxford. I currently hold a principal investigator position at the molecular medical imaging group at Vall d'Hebron Research Institute (VHIR), which I joined in 2019 after obtaining a PERIS fellowship for young researchers (granted sum: 113234 euros). Beyond this postdoctoral fellowship, I also led 2 national and 2 european competitive research projects (1.9M euros) in the group, initiated one industrial (ViRe Instruments) and three academic collaborations (VHIO, CIC biomaGUNE and Universidad de Santiago de Compostela) and supervised the set-up of a radiochemistry and preclinical imaging laboratory within the Preclinical Imaging Platform at Vall d' Hebron University Hospital. In 2022, I obtained a Junior leader fellowship from La Caixa Foundation (305.100 euros) to establish my own research line at VHIR and a Radboud Excellence fellowship (208.819 euros) to carry out collaborative work at the department of Medical Imaging at the Radboudumc (The Netherlands).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | BEJARANO BOSQUE, LEIRE |
| **Referencia:** | RYC2023-043669-I |
| **Correo Electrónico:** | leire.bejarano@gmail.com |
| **Título:** | Novel therapeutic strategies for the treatment of brain tumors |

**Resumen de la Memoria:**

Primary and metastatic brain tumors represent a significant challenge in terms of prognosis and therapeutic interventions. From the early stages of my academic career, I have been very interested in understanding the biology underlying brain tumors and developing new therapeutic strategies.

In 2014 I joined the laboratory of Prof. Maria Blasco, primarily recognized for her research in the telomere field. I had the great opportunity to start a research line focused on exploring novel therapeutic strategies for the treatment of glioblastoma (GBM). I studied an alternative strategy to target telomeres independently of telomere length by blocking the TRF1 telomeric protein, which is part of the shelterin complex that protects telomeres. This study showed that Trf1 genetic deletion in GBM mouse models inhibited tumor initiation and progression by a mechanism that involved DNA damage induction and reduction of proliferation and stemness. This effect was mimicked by TRF1 chemical inhibitors in patient-derived xenografts. With the ultimate goal to move our results to the clinic, I screened for TRF1 inhibitory drugs using a collection of FDA-approved drugs and drugs in clinical trials. This research proposed innovative drug combinations, aiming to effectively block potential resistance to individual drugs in patient-derived GBM xenograft models. Additionally, I performed an extensive study by depleting Trf1 in wild-type and cancer-prone p53- and Ink4Arf-deficient mice and demonstrated that Trf1 depletion does not affect organism viability. This comprehensive research led to three first-author publications in the journals of Cancer Cell (2017), EMBO Molecular Medicine (2019) and iScience (2019), as well as two patents for the use of TRF1 inhibitors in the treatment of brain cancer.

In the last decade, several studies have demonstrated the importance of the tumor microenvironment (TME) in cancer progression and therapeutic response. To gain expertise in the TME field, in 2019 I joined the lab of Prof. Johanna Joyce, internationally renowned for her contributions to this field. I started a research line focused on exploring and exploiting the tumor vasculature in brain metastasis. The tumor vasculature is a crucial TME component, but its heterogeneity had been underestimated up to date. I performed single-cell and bulk RNA-sequencing of sorted vascular cell types and detected multiple subtypes enriched specifically in BrM compared to non-tumor brain, including previously unrecognized immune-regulatory subtypes. We integrated the human data with mouse models, creating a platform to interrogate vascular targets for the treatment of BrM. This study shows that the CD276 immune checkpoint molecule is significantly upregulated in the BrM vasculature, and anti-CD276 blocking antibodies prolonged survival in preclinical trials. My research, published in Cancer Cell (2024), provides important insights into the complex interactions between the vasculature, immune cells, and cancer cells, with translational relevance for designing therapeutic interventions.

In summary, during my academic career, I gained invaluable expertise in multiple fields and acquired experience managing and leading my own projects, supervising students, applying for funding and writing manuscripts - which all together will contribute to the successful completion of this proposal.

**Resumen del Currículum Vitae:**

Over the course of a decade, I have dedicated my career to full-time research in the cancer field, training in top-ranking institutions and gaining experience in the fields of cancer biology, molecular biology, tumor microenvironment, immunology and aging.

I performed my PhD degree (2014-2018) under the mentorship of Prof. Maria Blasco at CNIO. My research line focused on exploring novel therapeutic strategies for the treatment of glioblastoma (GBM). Telomere maintenance is known the be essential for the indefinite proliferation of cancer cells. However, clinical trials with telomerase inhibitors have largely failed in solid tumors, perhaps due to telomere length heterogeneity in tumor cells. During my PhD, I worked on an alternative strategy to target telomeres independently of telomere length by blocking the TRF1 telomeric protein, which is part of the shelterin complex that protects telomeres. This research resulted in three first-author publications in the journals of Cancer Cell (2017), EMBO Molecular Medicine (2019) and iScience (2019), as well as two patents for the use of TRF1 inhibitors in the treatment of brain tumors.

In 2019, I joined the laboratory of Prof. Johanna Joyce at the University of Lausanne, Switzerland, as a postdoctoral fellow. Prof. Joyce is internationally renowned for her many contributions to advancing the tumor microenvironment (TME) field. I started a research line focused on understanding the biology and heterogeneity of the brain metastatic (BrM) vasculature, with the aim of deciphering the complex interactions between immune cells, cancer cells and vascular cells. Part of this body of research - comprising single-cell and bulk RNA-sequencing of vascular cells from human and mouse BrM, spatial TME imaging analyses, and preclinical studies using BrM models - has been published in Cancer Cell (Bejarano et al., 2024).

Beyond the first-author research publications, during my academic career I have also contributed to several collaborations published in high impact journals, including Cell (2023), Cell Reports (2017) and Brain (2020); as well as co-written a review for Cancer Discovery (2021), which has over 600 citations to date. I would also like to highlight my capacity to obtain funding. In fact, my research trajectory has been recognized by multiple awards, prizes, fellowships and grants in the different stages of my career, including the EMBO and HFSP long-term postdoctoral fellowships, La Caixa-Severo Ochoa International PhD fellowship and the Antonia Nieto Award for Excellence in Research by Predoctoral fellows, among others. I have actively participated in renowned international meetings, such as the 72nd Lindau Nobel Laureate meeting, which contributed to expanding and creating a diverse network of collaborators. Additionally, I have mentored students and I have actively engaged in the communication and outreach of our research work to non-specialized audiences.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | GROTHE , JAN MICHEL |
| **Referencia:** | RYC2023-043746-I |
| **Correo Electrónico:** | neurosev@gmail.com |
| **Título:** | Neuroimaging in Neurodegenerative Dementias |

**Resumen de la Memoria:**

Formally educated in physics and biology, I obtained my PhD ('summa cum laude') in 2014 from Rostock University Medical School (supervisor: Dr. Teipel) for my studies on a novel MRI biomarker for tracking cholinergic basal forebrain atrophy in the transition from normal aging to Alzheimer's Disease (AD). These studies resulted in 4 first-authored publications, all of them in D1 journals (e.g., Grothe et al. Biol Psychiatry 2012; Grothe et al. Alzheimers Dement 2014), and I was also awarded the prestigious "Steinberg-Krupp Alzheimer Research Award for Young Investigators" for this work. From 2014 to 2020, I worked as a postdoctoral researcher at the German Center for Neurodegenerative Diseases (DZNE), where I got trained in advanced computational analysis of a large variety of multimodal MRI/PET neuroimaging modalities, and worked with combined neuroimaging and deep phenotyping data of several large-scale observational cohort studies. Some of my principal contributions include the development of a highly cited PET-based method for staging regional amyloid-beta deposition (Grothe et al. Neurology 2017a), and combined imaging-genetic studies yielding novel insights into the genetic underpinnings of neurodegenerative pathology accumulation in the aging human brain (Grothe et al. Neurology 2017b; Grothe et al. Brain 2018). I have also led technological developments, including an internationally standardized method for automated hippocampus volumetry (Wolf et al. Alzheimers Dement 2017) and a software toolbox for partial volume correction in PET images (Gonzalez-Escamilla et al. Neuroimage 2017). In addition, I have extended my initial research focus on AD to the study of other neurodegenerative disorders, particularly Parkinson's disease (PD)(e.g., Ray,…,Grothe. Brain 2018).

My postdoctoral research involved international training and close collaborations with multiple renowned research institutions, most notably a collaborative research project on combined PET imaging and genetics with Harvard Medical School (Dr. Sepulcre) which led to a publication as second author in Nature Medicine (Sepulcre, Grothe et al. 2018; IF=30.6). Since 2019 I also hold a co-affiliation as Senior Research Associate in the Molecular Neuroimaging Group (Dr. Schöll) at the University of Gothenburg, where I supervise research studies examining regional patterns of pathology accumulation in PET data and their relation to novel fluid biomarkers of AD (e.g., Grothe et al. Neurology 2021).

In 2020, I joined the Movement Disorders Group (Dr. Mir) at the Institute of Biomedicine of Seville (IBiS) as a 'Miguel Servet' Researcher and Head of the Neuroimaging Section. Here, I established an independent line of research focused on using multimodal neuroimaging data for studying the neuronal correlates of cognitive decline in PD (e.g., Labrador-Espinosa et al. Mov Disord 2023; Schumacher et al. Brain 2023). Most recently, I have been appointed Director of the Neuroimaging Unit at the CIEN Foundation, Madrid, where I further develop my transdiagnostic research on the distinct effects that different neurodegenerative pathologies exert on regional neuroimaging patterns and clinical phenotypes and how these may be used for aiding differential dementia diagnosis (e.g., Grothe et al. Alzheimers Dement 2023; Silva-Rodriguez et al. Brain 2023; Costoya-Sanchez et al. JAMA Neurol 2023).

**Resumen del Currículum Vitae:**

Scientific Productivity and Excellence
I have published over 150 research articles in international peer-reviewed journals, including 21 articles as first author and 34 articles as senior author that have been published in some of the leading journals in the field, such as JAMA Neurology, Brain, Biological Psychiatry, and Alzheimer's & Dementia (all IF>10, total of 36 D1 publications as main author). Twelve of my papers as main author have been cited over 100 times>, and my most cited paper has been cited over 350 times (Grothe et al. Neurology 2017). My current H-index is 48, with a total of 7,917 citations (top 3% of most highly cited researchers in Spain).

I have also given >55 oral presentations at international conferences, workshops, and seminars, including the Opening Plenary of the Alzheimer's Imaging Consortium 2015 in Washington D.C.

My research has been awarded with the German 'Steinberg-Krupp Alzheimer Research Award for Young Investigators' (2014), the 'AAIC Postdoc Poster Prize' (2016), the 'AD/PD Junior Faculty Award' (2019), and the 'AAIC de Leon Neuroimaging Award' (2023).

Highlighting the excellence and maturity of my research career, in 2023 I received the Spanish R3 certificate of established researchers with a scoring of 96/100 (Biomedicine panel).

Leadership and Recognized Expertise
In 2016 I acquired my first major grant as PI to lead a collaborative research project with Harvard Medical School, and since then I have received continuous and overlapping funding to support my research, including the ISCIII 'Miguel Servet' fellowship, two consecutive ISCIII health research grants (2020, 2023), a research grant from the Junta de Andalucía (2021), as well as pre-doctoral (PFIS) and post-doctoral ('Sara Borrell') ISCIII fellowships that I obtained in the capacity as group leader.

At the DZNE I was the principal supervisor of a PhD student, who was financed by my research grant, and I also (co-)supervised 4 MD students. In my position as the head of the Movement Disorder Group's Neuroimaging Section at the IBiS, I was leading a team of 1 postdoc, 3 PhD students, a research assistant, and a neuropsychologist. Part of this team has also transitioned with me to the CIEN Foundation, and here I currently lead a team of 2 postdoctoral researchers, 2 PhD students, and a postdoctoral data manager. I also continue to mentor postdoctoral researchers at the DZNE and in my co-affiliated lab at the University of Gothenburg.

In 2022 I was elected as Editorial Board member of the journal Neurology, and I am Associate Editor of the journals Frontiers in Aging Neuroscience and Brain Connectivity. Moreover, I am an ad-hoc peer-reviewer for several of the leading journals in my field, such as Lancet Neurology, Science Translational Medicine, Nature Communications, JAMA Neurology, etc. (peer-review of >65 research articles). In addition, I have reviewed research project proposals for national and international funding bodies, and I am an annual abstract reviewer for national and international conferences. I have also organized scientific symposia at the Alzheimer's Association International Conference (AAIC, 3x), and I am frequently invited to chair

scientific sessions at this and other international conferences. Of further mention is my service as PhD thesis committee member at national (5x) and international (1x) Universities.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | HUERGA ENCABO, HECTOR |
| **Referencia:** | RYC2023-045456-I |
| **Correo Electrónico:** | hector_huerga@hotmail.com |
| **Título:** | Evolution of clonal hematopoiesis and diseases consequences |

**Resumen de la Memoria:**

After my PhD, to broaden my knowledge on how our body and the haematopoietic system respond to immune threats, I applied for a postdoctoral position in the lab of Dominique Bonnet, a scientific leader in the hematology field, and was recruited in 2019, since when I have been studying how human HSCs are regulated by environmental stress signals, influencing the development of clonal hematopoiesis. After one year at the Francis Crick Institute, the COVID19 pandemic started so I joined the Crick-Covid-19 Consortium to help setting up a testing facility at the Crick, leading to relevant publications in Nature Biotechnology (2020) and Lancet (2020) on which I was a co-author, as a contributing member of the Crick COVID-19 Consortium. I also took an active role in starting and leading a Covid19 research project in the Bonnet lab that resulted in the findings of how SARS-CoV-2 is able to infect specific subsets of red blood cells, resulting in two publications on which I am first author, in Stem Cell Reports 2021 and STAR Protocols 2021. The experience during the Covid pandemic fostered my confidence and capabilities to adapt to new and demanding research questions as well as working together with different researchers and team units. Returning to the focus of my postdoc, I received the Kay Kendall Leukaemia Foundation postdoctoral fellowship that allowed me to develop three main research projects with different perspectives on the feed-back loop of how the genes involved in DNA methylation, TET2 or DNMT3A, which drive clonal haematopoiesis, shape the immune system and at the same time how immune activation determines the evolution of clonal haematopoiesis. On one side of the loop, I have been characterizing in two different projects how different environmental factors select for TET2 or DNMT3A mutant haematopoietic stem cells (HSCs), which have resulted in two manuscripts on which I am first author on. In brief, (1) regarding TET2-derived clonal haematopoiesis we uncovered that HSCs bearing TET2 mutations are refractory to immune activation and become resistant to LPS mediated exhaustion – this work is now in preparation for publication; and (2) regarding DNMT3A, in collaboration with Andreas Trumpp's group from the DKFZ (Heidelberg), we characterized how frequent blood donation in humans could favor non-malignant DNMT3A-derived clonal haematopoiesis via erythropoietin (EPO) mediated mechanisms. On the other side of the loop, I have been working on defining the impact of clonal haematopoiesis on the function of the immune system. We recently described for the first time that TET2 mutations influence human neutrophil development and function. Our findings during this project on how TET2 mutations influence human HSCs differentiation inspired me to start writing and applying for funding to pursue my own research ideas in that direction. Over the last year I have been awarded different grants that have allowed me to start pursuing my independent ideas. Of particular interest in my future group will be the characterization of dendritic cells (DCs) during clonal haematopoiesis for their important role in effective vaccination. I believe that understanding how these processes are altered in the expanding clonal haematopoiesis population constitute an attractive and innovative research area that could unleash potential translational applications.

**Resumen del Currículum Vitae:**

Following my early interest in human disease, I studied Biology during my BSc at the University of Barcelona where I also obtained different undergraduate fellowships to start my training and gain research experience. During these initial fellowships, working in the field of evolution and development, I recognized the importance of fundamental research and this served to guide my research career. After graduating, I decided to use my Master of Science (MSc) placement to gain experience in clinical research working at the Vall d' Hebron Research Institute. In 2013, I was awarded two PhD fellowships to join Prof. Cristina Lopez-Rodriguez group at the Pompeu Fabra University in Barcelona. My doctoral studies focused on the innate immune response to pathogens and more specifically the regulation of the antiviral response. We described a novel mechanism to fine-tune activation of the IFN-I response, and its impact on HSCs and viral infection. This work was published in JEM (2020), with myself as first author. I additionally received the Doctoral-School-PhD Extraordinary Award from the University Pompeu Fabra (UPF) for the best PhD thesis (2019). I received the Kay Kendall Leukaemia Foundation postdoctoral fellowship that allowed me to develop three main research projects with different perspectives on the feed-back loop of how the genes involved in DNA methylation, TET2 or DNMT3A, which drive clonal haematopoiesis, shape the immune system and at the same time how immune activation determines the evolution of clonal haematopoiesis. In the last year, thanks to European Hematology Association (EHA) and Cancer Research UK (CRUK) funding I have started to build my own research ideas studying how immune cells are affected during clonal haematopoiesis.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | KASS YOUSSEF , KHALIL |
| **Referencia:** | RYC2023-042645-I |
| **Correo Electrónico:** | kkass@umh.es |
| **Título:** | Mechanisms of cancer initiation and plasticity |

**Resumen de la Memoria:**

Since I started my PhD, my research has always gravitated around the biology of cancer cells. This journey started when I joined Prof. C. Blanpain at IRIBHM-ULB (Belgium) to perform mu PhD. There, I took the challenge of understanding if and why different cells have the distinct competences to make cancer. Embracing cutting edge mice genetic tools, I developed in vivo tracking tools to seamlessly follow the response of skin epithelial cells to oncogenic hits. This allowed us to identify the cells at the origin of two most frequent skin cancer, the basal cell carcinoma (Nature Cell Biology, 2010) and the squamous cells carcinoma (PNAS, 2011). I further adapted my in vivo tracking system to perform single-clone lineage tracing and combine it with mathematical modelling to elucidate the logic of symmetric/asymmetric balance of stem/progenitor cells that controls homeostatic renewing (Nature, 2011) and cancer progression (Nature, 2016). Further, employing transcriptomics, I identified how the initiation of basal cell carcinoma require the early rewiring of epithelial differentiation state. As such, the epithelial stratification program is rapidly erased after oncogene activation and replaced by a program reminiscent of an embryonic developmental stage (Nature Cell Biology, 2012) in a mechanism dependent of Wnt/beta-catenin signaling (Nature Cell Biology, 2012) and Sox9 transcription factor (Cell Stem Cell, 2015). Targeting either of them results in reduced BCC initiation and hinders the development of resistance to hedgehog inhibitor-based therapies (Nature, 2016).

Subsequently, I joined the laboratory of Prof. Angela Nieto, a leader in the field of cell plasticity and developed a new approach combining in vivo lineage tracing and single-cell OMICs to compare epithelial plasticity in development, fibrosis and cancer. My most important finding was the discovery of two universally conserved functional epithelial plasticity programs leading to (i) embryonic-like epithelial to mesenchymal transition (EMT) driving invasion and dissemination, or to (ii) an adult injury response EMT featuring inflammation and fibrosis (Nature Reviews Molecular Cell Biology, 2024). I also found that there is no specific EMT or epithelial plasticity program in cancer, as assumed in the EMT-field (type 3 EMT). Instead, the embryonic invasive and adult inflammatory EMT programs coexist within the same tumor in segregated cancer cell populations to drive cancer cells dissemination and immune response, respectively. This new concept highlights a new mechanism for intra-tumor functional heterogeneity and provides a novel frame to interpret tumor evolution (Nature Communications, 2019) (Nature Cancer, in review). My original research and collaborations resulted in 15 publications in highly prestigious journals with more than 3000 citations.

My previous expertise on cancer biology and my acquired background in neuroscience in the institute of neuroscience of Alicante allowed me recently to set my own original line of research. In the latest, I aim to study how the interaction between the epithelial cells and surrounding innervation shapes vulnerability to cancer or degenerative diseases. I have recently secured a 4-year grant (200,000 euros, AECC) to study the role of the peripheral nervous system in breast cancer malignancy and resistance to therapy.

**Resumen del Currículum Vitae:**

Education
2006-2012. PhD-Biomedical and Pharma Sciences (Summa cum laude), Université libre de Bruxelles (ULB), Brussels, Belgium
2003 - 2005. Master in Molecular Biology, ULB, Brussels, Belgium
1998 − 2003. Degree Biology-Biochemistry, University of Damascus, Syria

Research experience
2022-present. Investigator AECC/ senior postdoc transition to emerging PI with independent line of research

2014-2022. Postdoc at laboratory of cell plasticity in health and disease (Nieto's Lab) at Instituto de Neurociencias (HMH-CSIC). Alicante, Spain. Competitive funding: (I) EMBO Long-Term Postdoctoral fellow (ALTF 977-2014-Europe) and (ii) Severo Ochoa Postdoctoral Programme (Spain).

2012-2014. Full time scientific staff, (ULB, Belgium

2006 -2012. PhD in the laboratory of stem cells in cancer (Blanpain's Lab) at ULB, Belgium. Competitive funding: (i) PhD fellowships (FNRS-FRIA-BELGIUM) and (ii) Cancer research fellowship (Télévie-BELGIUM).

Publications
Publications: 15. First author: 5. Total citations: 3011.
1st author publications (* indicates equal contribution)

Youssef KK*, Van Keymeulen A*, Lapouge G*, et al. Identification of the cell lineage at the origin of basocellular carcinoma. Nature Cell Biology, 2010.

Lapouge G*, Youssef KK* et al. Identifying the cellular origin of squamous skin tumor PNAS, 2011.

Youssef KK et al. Adult interfollicular tumour-initiating cells are reprogrammed into an embryonic hair follicle progenitor-like state during basal cell carcinoma initiation. Nature Cell Biology, 2012.

Youssef KK, Nieto MA. Glucose Metabolism Takes Center Stage in Epithelial-Mesenchymal Plasticity. Dev Cell, 2020.

Youssef KK*, Nieto MA*. (2024). EMT in development, homeostasis and tissue repair. Nature Rev Mol Cell Biol, 2024. (accepted, final editorial revisions).

Youssef KK et al. Two distinct Epithelial to Mesenchymal Transition Programmes Control Invasion and Inflammation in Segregated Tumour Cell Populations. Nature Cancer. (In final review).

Congresses and communications

invited talks: (i) Minisymposium: microenvironmental cues in regeneration, aging and inflammation (2013) Biocenter Oulu, Finland. (ii) Lectures and workshop on stem cell niche and cancer stem cells at the 5th international Royan Summer School, 2014, Teheran, Iran.

8 selected oral presentations and 18 poster presentations at international meetings. Awarded best poster presentation: (i) Joint meeting 2018. SPBD, SEBD, SFBD. Porto, Portugal. (ii) Sep 2010, Hydra VI European summer school 2010.

Research projects

1- Emerging PI with independent line of research:

AECC (Spain) (2022). PI: Khalil Kass Youssef (200.000 euro- 4 years). Project title: The role of cancer cells-neurons interactome in breast cancer evolution to malignancy and resilience to therapy.

2-Main scientific researcher:

GVA-PROMETEO (Spain, 2017). PI: Angela Nieto. Project title: Cell Plasticity in Biomedicine.

MINECO (Spain, 2015). PI: Angela Nieto. Project title: Cell plasticity and behaviour in epithelial homeostasis and tumour progression.

ERC- 7PC/ERC/CANCERSTEM (Belgium, 2013). PI: Cédric Blanpain. Project title: Stem cells in epithelial cancer initiation and growth.

Fondation Belge contre le cancer (Belgium, 2010). PI: Cédric Blanpain. Project title: Defining the role of stem cells during cancer initiation, growth and relapse after therapy. (ref. GB350/BLANPAIN).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | CAPILLA GONZALEZ, VIVIAN |
| **Referencia:** | RYC2023-043933-I |
| **Correo Electrónico:** | vivian.capilla@cabimer.es |
| **Título:** | Desarrollo de nuevas estrategias para mejorar los tratamientos oncológicos |

**Resumen de la Memoria:**

I am the Group Leader of the Stem Cells and Translational Neurology laboratory and Scientific Coordinator of the Cytometry Unit of CABIMER. I have more than 15 years of experience investigating in the field of stem cells and neuroscience (h-index 21; 40 publications, 1122 citations). After obtaining my degree in Biology at the University of Valencia (2006), I joined the research group of Dr. Jose Manuel Garcia-Verdugo to initiate my PhD (2006-2011) awarded by competitive fellowships (V Segles, FPU). I investigated the detrimental effects of nitrous compound on structural and functional integrity of the neural stem cell niches in the adult mouse brain. This research was honored with the Luis Vives Award of the Rotary Foundation (2006). During my PhD, I performed 2 pre-doctoral stays at the prestigious Johns Hopkins University (USA) to increase my experience and expand horizons.

After earning my PhD degree with Cum Laude grade, I decided to leave Spain and return to Johns Hopkins University to work as postdoctoral researcher (2012-2014), funded by an R01 grant from the National Institute of Health (R01 NS070024). My investigations focused on evaluating the implication of pathological conditions (i.e., radiotherapy and aging) on the neural stem cells and the regenerative capacity of the brain. Furthermore, I participated in other collaborative projects focused on cancer and stem cells. During my postdoctoral stage in USA, I had the opportunity to work closely with cancer patients, which provided me new insight on the barriers that they need to face during and after cancer treatments, delineating my future independent scientist program.

In 2014, I moved to Seville (Spain) and joined the CABIMER, where I had the opportunity to investigate the therapeutic potential of stem cells. I obtained several competitive national contracts (Sara Borrell, Miguel Servet) that helped me to initiate a new stage as Principal Investigator (PI). In 2020, I was promoted to Group Leader with a scientific program focused on the development of novel stem cell-based therapies for brain disorders. Currently, my group is composed of 1 PI, 1 postdoctoral researcher, 2 PhD students and 3 technicians. I have contributed to the training and mentoring of young researchers, being the formal director of 3 theses (in progress), 8 TFM, 1 TFG and 5 national and international students (2 ERASMUS+, 1 Fulbright-US, 2 JAE Intro). I obtain overlapping funding from different entities, being sole PI of 7 competitive grants (4 national, 3 regional) and 10 competitive contracts/fellowships (1 international, 5 nationals, 4 regionals) (total funding as IP: ~1.500.000 €). I have published 6 articles in Q1 scientific journals as corresponding author directly related to my scientific program and have filled 6 patents, apart from collaborative articles. My group collaborates with researchers from top national and international centers (e.g. Charité Universitätsmedizin Berlin or Mayo Clinic) and is part of important networks, such as the COST Action CorEuStem or the ASEICA.

The main lines of research of my group are:
1. To explore the therapeutic properties of stem cells in pediatric brain tumors
2. To elucidate the mechanisms underlying the therapeutic effects of stem cells
3. To develop new strategies to improve the therapeutic actions of stem cells in neurological disorders

**Resumen del Currículum Vitae:**

EDUCATION
2006 Degree in Biology, University of Valencia, Spain
2011 PhD in Biology, University of Valencia, Spain

POSITIONS
2020-present, Group Leader, CABIMER, Spain
2014-2019, Senior Postdoctoral researcher, CABIMER, Spain
2012-2014, Postdoctoral researcher, Johns Hopkins University, USA
2011, visiting PhD student, Johns Hopkins University, USA
2007, visiting PhD student, Johns Hopkins University, USA
2006-2011, PhD student, University of Valencia, Spain
2005-2006, Boarding student, Hospital General Universitario de Valencia, Spain
2003-2006, Undergraduate research assistant, University of Valencia, Spain

SCIENTIFIC PRODUCTION
H-index: 21
Citations: 1122
Nº of publications: 40 (19 as main author)
Nº of indexed articles: 33
Nº of articles in Q1: 22
Nº of patents: 6
Nº of participations in conferences: 43 (25 national and 18 international)
Top journals: PNAS, Nat Commun, Mol Ther, J Pineal Res, Glia, Stem Cells

FUNDING OBTAINED AS PRINCIPAL INVESTIGATOR
7 competitive I+D+I projects (4 national and 3 regional)
10 competitive contracts/fellowships (1 international, 5 national, 4 regional)
1 national crowdfunding activity
1 collaboration agreement with the Asociación Pablo Ugarte
Total funding as IP: ~1.500.000 €

GRANTED CONTRACTS/FELLOWSHIPS/AWARDS
2023, R3 certification
2022 and 2022, Prize for the promotion of scientific vocations - Fundación Merck Salud/ASEICA
2020, Miguel Servet, ISCIII
2017, Juan de la Cierva-Incorporación, Ministerio de Ciencia e Innovación (non-activated)
2017, Sara Borrell, ISCIII
2008, FPU, Ministerio de Ciencia e Innovación (non-activated)
2008, V Segles, University of Valencia
2006, Luis Vives Award, Rotary club
2005, Scholarship for Boarding student, Ministerio de Educación y Ciencia

TEACHING EXPERIENCE
- 3 doctoral thesis under direction and supervision
- 8 directed and supervised Master's final projects
- 1 directed and supervised Final Degree Project
- Professor in Master 'Fundamental and Translational Neuroscience' (University Pablo Olavide)

INTERNATIONAL ACTIVITIES
- Director of the Fulbright-US grant of Caroline Stockwell, University of Rochester, 2023, USA
- International Research Exchange Activities with Mayo Clinic (#EST23/00353), 2023, USA
- Supervisor of Erasmus+ students (2022 and 2021) from Poland
- Co-awardee of a FAPESP grant (ref 22/02876-0), Brazil.
- International stays in the Johns Hopkins University (30 months), USA
- Member of the COST Action CorEuStem (CA20140)
- Member of the evaluation committee at ASEICA international congresses 2022 and 2023
- Participation in international congresses (e.g. IBRO, EACR, FENS, ASEICA, etc)
- Main Editor of a Research Topic in international collaboration (https://shorturl.at/zDXY5)
- Participation as postdoctoral researcher in a R01 grant from the National Institute of Health of the USA (R01 NS070024)

OTHER RELEVANT MERITS
- Scientific coordinator of the Cytometry Unit of CABIMER
- Scientific coordinator of the I Symposium of R2-R3 researchers of the FPS
- Coordinator in Andalucia of the event CONOCELAS - ASEICA
- Project Evaluator for the Consejeria de Salud y Familias - Junta de Andalucia
- Editor and reviewer for scientific journals (e.g. Stem Cells Transl Med, Cancers, Leukemia, Pineal Research, Sci Rep, Front Cell Neurosci)
- Member of thesis committee: 9
- Dissemination activities (e.g. Science Week, CONOCELAS)
- Invited speaker in the Simposio III Semana de Cajal 2016

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | MENDIZABAL ECEIZABARRENA, ISABEL |
| **Referencia:** | RYC2023-044682-I |
| **Correo Electrónico:** | ixa.mendizabal@gmail.com |
| **Título:** | Evolutionary and disease multiomics |

**Resumen de la Memoria:**

Understanding disease from an evolutionary and regulatory perspective to attack its vulnerabilities is an overarching theme of my research trajectory. I am a junior principal investigator in my path-to independence (supported by Ikerbasque Agency). After securing funding as an independent PI, I am initiating lines of research that leverage my extensive bioinformatics training. For my current career stage, I am determined to increase the translational potential of my research.

I posit that prostatic pathologies, closely associated to age and life-style factors, are excellent models to apply evolutionary epigenomic principles to understand disease vulnerabilities. I have designed a research program consisting of three lines of research that capitalize on my expertise in evolutionary biology (PhD training) complex disease epigenomics (postdoc) and prostate cancer biology (transitioning period). By generating timely and cutting-edge multiomic datasets from our patient cohort (in a joint effort with Basurto University Hospital) as well as by digging the large body of publicly available datasets, I aim at contributing to the implementation of precision medicine in urogenital diseases.

**Resumen del Currículum Vitae:**

Starting in late 2020, I am an Ikerbasque Research Fellow at CIC bioGUNE in Bilbao. This position involves a 5-year tenure-track program funded by the Basque Agency for Science. I am a junior principal investigator in a path-to independence framework, having recently initiated research lines that leverage my extensive bioinformatics training.

The overarching theme of my research trajectory is to understand diseases from both an evolutionary and regulatory standpoint. Since joining CIC bioGUNE, my primary goal has been to enhance the translational impact of my research. I am affiliated with a translational Lab established between CIC bioGUNE and Basurto University Hospital, where I lead computational research lines. This affiliation affords me a unique opportunity to access patient cohorts featuring various urogenital pathologies. The multiomic analyses on well-annotated patient cohorts hold great promise for advancing precision medicine in prostatic diseases, and my group aspires to establish itself as a reference in this field.

Scientific excellence: Through 22 publications, I had high impact in the field of evolutionary and disease genomics. The research I contributed the most as first author (13 of the articles, including 1st decile journals such as Nat.Commun., PNAS, Genome Biol., NAR, MBE) has provided critical insights in timely questions about complex disease aetiology. See my Google Scholar at this link: https://scholar.google.com/citations?hl=es&user=yWqqkuQAAAAJ

Internationalization: After obtaining my PhD on human population genomics (Prof. David Comas, Pompeu Fabra University, with Extraordinary Award), in 2013 I joined the group of Prof. Soojin Yi at Georgia Tech (USA), one of the few labs in the world focused on evolutionary epigenomics. During this six-year postdoctoral period, my research geared towards a deeper functional genomics angle, focusing on understanding the role of epigenomics in the regulation of cell-type specific transcriptional programs. My international experience is complemented with research stays in prestigious labs in the Netherlands and South Korea.

Leadership: My expertise bridges critical fields for complex disease research such as bioinformatics, functional, and evolutionary multiomics. I have secured funding as principal investigator. Besides the Ikerbasque grant (€230K 2020-2025), in 2021 I obtained a highly competitive grant by the CRIS Foundation (€400K, 5 years). These grants allow me building an ambitious research program on prostatic disease evolutionary epigenomics. I currently lead a group of four PhD students (one MSCA-ITN) and a bioinformatic technician. We are increasing the visibility of our emerging lab through international and national collaborations and advancing on timely projects with incoming publications (last authorships).

**Área Temática:** Biomedicina
**Nombre:** UZQUIANO LÓPEZ, ANA
**Referencia:** RYC2023-043149-I
**Correo Electrónico:** anauzquiano@hotmail.com
**Título:** Principles governing cerebral cortex development

**Resumen de la Memoria:**

The brain is the center of exceptional cognitive abilities, enabling functions such as elaborate working memory, abstract thinking, and advanced forms of communication. These abilities are intricately connected to the expansion and diversification of the human cerebral cortex, which occurred through the refinement of the mechanistic principles governing cortical development over the course of mammalian evolution. Elucidating the molecular and cellular mechanisms that have culminated in the human cerebral cortex is thus crucial to decipher what sets humans apart from other mammals and to expose events that when they go awry result in severe neurodevelopmental diseases.

My previous research focused on investigating different cell intrinsic mechanisms regulating cortical development. My doctoral work focused on deciphering the contribution of neuronal progenitors to cortical malformations, through the study of the heterotopia gene Eml1, mutations of which cause abnormal neuronal position in the mouse and human brain. My postdoctoral research investigates the developmental events that have driven the expansion and diversification of the human cortex, and how disruptions of these processes result in conditions such as Autism Spectrum Disorders (ASD). For this, I have leveraged human brain organoids, a powerful model to study human-specific features of brain development.

Many studies, including my PhD and postdoctoral research, have investigated the intrinsic genetic programs that instruct the development of the cerebral cortex. However, how these cell autonomous mechanisms are shaped by the extracellular context remains understudied. My goal is to investigate how extrinsic signals intersect with intrinsic mechanisms to guide human cerebral cortex development in physiological conditions and disease states. For this, in my lab we will 1) identify extracellular matrix (ECM) components involved in human corticogenesis and the etiology of ASD; 2) investigate the role of intercellular communication in determining neuronal population size; and 3) decode the relevance of lineage of origin for the emergence of species-specific neuronal properties. We will leverage the use of in vitro and in vivo models of brain development, gene manipulation techniques, imaging, and high throughput "omics" approaches.

I believe my previous training and research experience on cortical progenitor biology, projection neuron diversification, and neurodevelopmental disorders, as well as the technical expertise acquired, place me in a unique position to lead the research proposed in this application.

**Resumen del Currículum Vitae:**

Over the last 10 years I have been interested in understanding the mechanistic principles that govern the formation of mammalian cerebral cortex, which has greatly expanded during evolution and is responsible for human cognitive abilities.

By working in multiple labs across different countries (United Kingdom, France, United States), I have become an expert in brain development and associated disorders. As a master student (2014) I joined the lab of Dr. Sarah Guthrie (King's College London, United Kingdom) to investigate the mechanisms underlying motor neuron nuclei formation, resulting in my contribution to a research article (Montague et al., 2017). After this period, I obtained a fellowship from the Paris Neuroscience School to perform my PhD at Sorbonne University (France). After a year of lab rotations, I joined the lab of Dr. Fiona Francis (Institut du Fer à Moulin, Sorbonne University, France) to pursue my PhD. During this period, I focused on unraveling cellular and molecular mechanisms underlying severe cortical malformations by leveraging mouse models, imaging, and biochemical techniques. I published my research in three first/co-first author publications (Cell Rep, J Anat, Sci Rep), wrote a review with renowned scientsts in the cortical development field (J Neurochem), and an article comment (Brain). During this time, I also contributed to other projects with both in-lab and external collaborators (Jabali et al., 2022, EMBO Rep, Zaidi et al., under revision at JCB). Finally, as a reflection of the outstanding research I performed, I was granted several awards, including the Prix Valérie Chamaillard from the French Epilepsy Foundation and the PhD thesis award from the French Neuroscience Society.

The scientific excellence achieved in my PhD paved the way for a postdoctoral position at Dr. Paola Arlotta's lab (Harvard University, United States). During my postdoctoral work, I am investigating developmental programs governing the diversification of projection neurons in the human cerebral cortex and associated neurodevelopmental disorders (i.e., Autism Spectrum Disorders), using human brain organoids and single cell genomics. My postdoctoral research thus far has led to two first/co-first author publication (Cell, Hum Mol Genet) and to the obtention of the Charles A. King Trust Postdoctoral Fellowship, from The Medical Foundation at Health Resources in Action, MA. This fellowship is awarded to senior postdoctoral fellows to support their transition to independent academic positions, and has allowed me to develop my own independent line of research focused on cortical progenitor lineages and upper layer neurons' expansion in the human brain. During these years I have also written a review (Curr Opin Genet Dev), and a book chapter (Wiley). Furthermore, I actively collaborated with colleagues, contributing to additional research articles (Paulsen et al., 2022, Nature; Paulsen*, Pereira Luppi* et al., in prep, Lipinski*, Gonzalez-Bohorquez* et al., in prep).

In the context of both my PhD and postdoctoral work, I presented my research at over 25 different scientific meetings and renowned institutions, often securing travel awards for these presentations. Additionally, throughout this time I have supervised 1 PhD student, 2 PhD rotation students, 2 Bachelor students, and 2 technicians.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** **Biomedicina**
**Nombre:** PRADOS MARTIN, ALEJANDRO
**Referencia:** RYC2023-044467-I
**Correo Electrónico:** alexpramar@gmail.com
**Título:** Fibroblast immuno-biology during homeostasis, inflammation and cancer

**Resumen de la Memoria:**

Throughout my scientific career, my central research focus has revolved around the exploration of fibroblast heterogeneity and dynamics, delving into their intricate interactions with various cell types, including immune and cancer cells. Utilizing cutting-edge technology, my investigations have unveiled the underlying mechanisms governing fibroblast behavior in both health and disease, challenging the conventional notion of fibroblasts as a homogeneous cell type and showcasing their remarkable diversity and functional plasticity across different tissues.

My comprehensive analyses of human fibroblasts have revealed both shared and unique functional properties and molecular signatures, breaking new ground in the field. Notably, my research identified a distinctive population of perivascular mesenchymal stem cells in children's tonsils and illuminated the organization of intestinal lymphoid tissues by two distinct fibroblast lineages shaping tissue architecture and playing distinct roles in gut immunity. Furthermore, I've demonstrated the pathogenic role of fibroblasts in comorbid diseases like rheumatoid arthritis, heart valve disease, and Crohn's disease, while also highlighting a subset of antigen-presenting fibroblasts in the lungs with tumor-suppressive properties.

In delineating the trajectory of my future research endeavours, my aspiration is to synthesize existing knowledge, giving rise to groundbreaking therapeutic modalities. The core objective is to play a pivotal role in the advancement of strategies designed to alleviate the impact of metastatic manifestations, with a primary emphasis on pioneering fibroblast-centric therapeutic interventions. This entails exploring novel pathways to target fibroblasts, unravelling molecular circuits operating across diverse tumor sites capable of promoting metastatic dormancy, and undertaking a thorough analysis to elucidate the role of CAFs in mineral metabolism.

**Resumen del Currículum Vitae:**

My contributions to the scientific community encompass 15 papers published in high-impact journals, with 4 as the lead author and 2 in journals boasting an impact factor higher than 20. My work has achieved an h-index of 11 with 470 citations, reflecting its positive reception within the scientific community. Overall, my research has significantly advanced our comprehension of fibroblast dynamics and their pivotal role in comorbid inflammatory diseases and cancer therapies.

My steadfast commitment to excellence is evidenced by my proactive pursuit of collaboration with esteemed institutions and top research groups worldwide. This commitment has led me to work in four different countries and collaborate with five distinguished European institutions, each contributing to my exposure to diverse research methodologies, approaches, and best practices, thereby broadening my understanding of the challenges and opportunities within my field.

Demonstrating autonomy and leadership in my scientific pursuits, I have consistently secured personal funding and engaged in collaborative grant opportunities to advance my research goals. My proactive approach in seeking resources and opportunities has been instrumental in driving progress in my field. In addition to individual accomplishments, I have successfully collaborated with peers to develop and execute impactful research projects, mentoring undergraduate and postgraduate students and co-supervising three master's and one PhD thesis. Recognition of my dedication to scientific independence and excellence is evident through prestigious grants such as the "FPU" fellowship and "Ayuda Investigador AECC 022," which have empowered me to pursue my research interests with increased autonomy and effectiveness.

Beyond research, I have embraced opportunities to teach and mentor undergraduate and postgraduate students, leading small classes in research methods for Biology, Biochemistry, Pharmacy, and Odontology students. My commitment to effective teaching is further underscored by obtaining the "Acreditacón de Profesor Contratado Doctor" by the ANECA, certifying my credentials as an assistant professor.

**Área Temática:** **Biomedicina**
**Nombre:** DEL CAMPO MILAN, MARTA
**Referencia:** RYC2023-043831-I
**Correo Electrónico:** mcampo@barcelonabeta.org
**Título:** Neurocientifica especializada en el desarrollo de biomarcadores para Alzheimer y distintos tipos de demencias neurodegeenrativas

## Resumen de la Memoria:

I am an expert in translational neurobiology, including Alzheimer's disease (AD) and other neurodegenerative diseases that ultimately cause dementia. My overall goal is to understand the biological changes that cause dementia to develop diagnostic tools to pave the way for disease treatment or preventive strategies. My research involves validating and implementing classical AD biomarkers in clinical practice and trials, identifying, and developing novel fluid biomarkers in cerebrospinal fluid (CSF) and plasma, and studying novel protein biomarkers and their pathways in AD pathogenesis. Amongst the main contributions of my career, I have been involved in updating and extending the major guidelines to standardise preanalytical factors that influenced AD CSF biomarkers. I have developed a research roadmap to utilise the novel AD plasma biomarkers in clinical trials. I have identified new biomarkers for AD, frontotemporal dementia (FTD) and dementia with Lewy bodies (DLB) and ignited further etiological and mechanistic studies in those fields. Furthermore, I have led studies to integrate CSF proteome and genome data to uncover AD-causing proteins and pathways. I have produced 36 publications (30 Q1. 15 as first, 12 as corresponding author, and 5 as last author). I have attended over 30 (inter)national recognised conferences and had my research selected for oral presentation 18 times. I have been invited 7 times to give presentations at scientific conferences and research institutions. Additionally, I am (or have been) the PI or co-PI in 8 research projects, the primary researcher in 3 projects (PhD, MSc, and BSc thesis work), and a collaborator or team member in 15 other projects. My research has a distinct real-world application, with my findings translated into realistic CSF biomarker panels that may be useful for dementia diagnosis and surrogate indicators in therapeutic trials, as well as collaborations with industry to determine whether recently developed AD plasma biomarkers and assays can be used in clinical trials.

My current research is divided in two main inter-connected topics: the development of diagnostic tools and the identification of potential therapeutic targets. I follow a bedside-to-bench-to-bedside strategy, which entails identifying the main pathophysiological changes with diagnostic or therapeutic potential in human samples, bring those results into the lab for further validation using appropriate tests and experimental models and, translate findings into optimal tools that can be applied in clinical settings or trials. Besides the continuation of my studies on the validation and implementation of classical AD biomarkers, I would like to expand my group's research along the following lines: the development, validation and implementation of novel pathology-specific fluid biomarkers for AD, the identification of therapeutic candidates to tackle the multifactorial nature of the disease and the development of a research fluid biomarker platform for clinical trials.

## Resumen del Currículum Vitae:

I am an expert in translational neurobiology, with a specialisation in Alzheimer's disease (AD) and other neurodegenerative diseases ultimately leading to dementia. My goal is to understand the biological alterations that underpin various forms of dementia to provide knowledge for the development of diagnostic tools and potential interventions for treatment or prevention.

My research focuses on (i) the validation and implementation of the classical AD biomarkers in clinical practice and trials, (ii) the identification and development of novel fluid biomarkers in both cerebrospinal fluid (CSF) and plasma for different types of neurodegenerative dementias, and (iii) investigating the role of protein biomarkers and its pathways in AD pathogenesis. My major contributions to the field include updating and extending the main guidelines to standardise preanalytical factors that influenced AD CSF biomarkers and designing a research roadmap to implement the new AD plasma biomarkers in clinical settings and trials.

I am the co-PI of the PRIDE and bPRIDE projects, which shed light on the protein changes and pathways involved in the pathophysiology of AD, frontotemporal dementia (FTD), and dementia with Lewy bodies (DLB) across various stages. Our research has revealed new biomarkers and suggested etiological and mechanistic studies. The designed approach allows bench-to-bedside translation of biofluid-based proteomics, making it relevant to various research fields.

I prioritise the translational aspects of my studies. Our proteomics findings have been translated into realistic CSF biomarker panels, that may be useful for dementia diagnosis and surrogate indicators in therapeutic trials. I have collaborated with industry to develop and validate tools for FTD diagnosis. (iii) I am forming partnerships with industry to evaluate whether recently developed AD plasma biomarkers and assays can be used in clinical trials.

I fully engage in dissemination, communication, and disease awareness activities. I have attended over 30 (inter)national renowned conferences, having my studies selected for oral presentation 18 times. I have been invited 7 times to give lectures in scientific conferences and research institutes. I have established partnership with patients' associations and presented in specific conferences and specialized magazines (e.g. Alzheimer' Europe conference in 2020 and magazine in 2021). I routinely post the findings of my studies on social media and other platforms and participate in audiovisual media outreach activities.

I have (co)supervised 2 PhD Theses and more than 15 BSc and MSc projects to completion. Currently, I am the co-supervisor of 1 PhD student. I have extensive teaching experience as a lecturer at San Pablo CEU University, UAM, and Vrije Universiteit. For that, I have been accredited by ANECA as associate professor.

I am an active reviewer for various publications in the field, as well as an associate editor of Alzheimer's Research & Therapy. I am a member of two separate consortia that share proteomics and genomic findings (i.e. the Coral and Scallop consortium). In 2022, I was chosen vice chair of the Alzheimer's Association's Biofluid Based Biomarkers Professional Interest Area (BBB-PIA), which seeks to advance BBB research in the context of neurodegenerative dementias.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | GUZMAN DE LA FUENTE, ALERIE |
| **Referencia:** | RYC2023-045776-I |
| **Correo Electrónico:** | alerie4@googlemail.com |
| **Título:** | Los OPCs como factores clave en la homeostasis del sistema nervioso central y la interacción entre inflamación y remielinización |

#### Resumen de la Memoria:

Mi trayectoria investigadora se ha centrado en identificar los mecanismos moleculares, celulares y sistémicos que regulan la capacidad de la células progenitoras de oligodendrocitos (OPCs) para formar oligodendrocitos formadores de mielina y así regenerar la mielina perdida en diferentes enfermedades del Sistema Nervioso Central (SNC), como la esclerosis múltiple (EM). En concretó en mi doctorado en la Universidad de Cambridge investigué como los receptores nucleares regulan la diferenciación de los OPCs. Durante mi primera etapa postdoctoral en la misma universidad, complementé dicho conocimiento centrándome en factores celulares (pericitos y células mesequimales), así como factores sistémicos (microbiota y envejecimiento) influyen la restauración de la mielina mediante diferenciación de los OPCs en el SNC. Este conocimiento me permitió obtener financiación para trasladarme a Queen's University Belfast como "early career fellow" dónde aporté mi conocimiento sobre la biología de los OPC y la mielina en el contexto del envejecimiento y expande mis conocimientos formándome en neuroinmunología. Durante este periodo investigué la interacción entre las células T reguladoras y el SNC, con especial énfasis en determinar cómo el envejecimiento afecta a la capacidad de las células T reguladoras para aumentar la remielinización y limitar la gliosis.

Mi sólida formación en el campo de la biología de los OPCs y la regeneración de la mielina junto con la adquisición de conocimientos de neuroimmunología y mi interés en el envejecimiento, me han permitido obtener financiación para establecerme como investigadora principal en el Instituto de Investigación Sanitaria y Biomédica de Alicante (ISABIAL) en 2022. El objetivo principal de mi línea de investigación y grupo de investigación es descubrir el papel de las OPCs en la dinámica interacción entre la inflamación y la regeneración de la mielina en el SNC. Esta investigación trata de responder a la siguiente pregunta central: "¿cómo podemos aprovechar el potencial de las OPCs como células madre para controlar la inflamación y mejorar la reparación de la mielina en el SNC?". Para abordar esta pregunta, buscamos profundizar en la comprensión actual de la biología de las OPCs. Las OPCs destacan como el grupo de células madre más extenso en el SNC, convirtiéndolas en un reservorio único para estimular el proceso regenerativo más robusto y natural en el SNC, la regeneración de la mielina (remielinización). Nuestro enfoque aspira a estudiar la compleja interacción entre las OPCs, la inflamación y la remielinización, centrándonos en el innovador concepto de memoria inflamatoria mediada por la reprogramación epigenética. Para ello nos centraremos en 3 objetivos: 1) Entender si las OPCs actúan de factor limitante de la inflamación para mantener la homeostasis en el SNC, 2) Determinar cómo la inflamación afecta a la biología de las OPCs y su capacidad regenerativa a corto y largo plazo y 3) Investigar si los OPCs acumulan memorias de estímulos previos que cambien su respuesta anti-inflammatory y regenerativa.

Mi objetivo general es crear un nuevo programa de investigación que integre conocimientos de células madre y biología regenerativa, neurociencia e inmunología para desbloquear el potencial de las OPCs como células madre y formadoras de mielina, con el fin de preservar la salud cerebral.

#### Resumen del Currículum Vitae:

Durante mi doctorado en la Universidad de Cambridge, investigué la biología de las células progenitoras de oligodendrocitos (OPCs) en la mielinización y remielinización. Establecí un papel regenerativo para la vitamina D, que mediante su unión al receptor de vitamina D, actúa como factor clave en la diferenciación de las OPCs a oligodendrocitos (JCB, 2015), lo que me valió una nominación para el Premio a Mejor Investigación del 2015 de la Sociedad de Esclerosis Múltiple del Reino Unido en 2016. En este periodo, también lideré el primer estudio que describiendo un papel regenerativo para los pericitos en la diferenciación de las OPCs en oligodendrocitos y en la remielinización, ahondando en entender mejor cómo varios mecanismos celulares contribuyen a regular la remielinización (Cell Reports, 2017).

En mi posdoctorado en la Universidad de Cambridge, exploré las señales moleculares que rigen la biología de las OPCs con el envejecimiento. Mi investigación reveló que, aunque importantes para la mielinización en desarrollo, la contribución de la proteína de unión a ácidos grasos 7 en la remielinización era redundante (Glia, 2020), destacando las diferencias moleculares entre la mielinización en desarrollo y la reparación de la mielina. Colaborando con MedImmune / AstraZeneca, lideré el primer estudio de proteómica en centrado en el envejecimiento de las OPCs, una base de datos única para el campo que reveló cambios en los OPCs con implicaciones para la reparación de la mielina y trastornos neurológicos relacionados con la edad (MCP, 2020).

Estos logros me permitieron obtener financón de dos prestigiosas entidades internacionales, Wellcome y ECTRIMS, para trasladarme a Queen's University Belfast, como "early career fellow". Combinando mi experiencia en la biología de OPCs, remielinización y envejecimiento, con la formación en neuroinmunología que adquirí, lideré proyectos explorando el papel regenerativo de las células T en la reparación de la mielina y cómo cambian con la edad dándo lugar a los primeros artículos experimentales firmados como autora de correspondencia (De la Fuente et al., Ncomms, 2024 (IN PRESS); Mayne y Young et al., 2024, En preparación). Además, establecí sendas colaboraciones con expertos en el campo de la neuroinmunología (De la Vega-Gallardo et al., PNAS, 2020; Pasciuto et al., Cell, 2020; Matute-Blanch et al., Clin Tranl Med 2022). Mi liderazgo y trayectoria ascendente, se reconocieron mediante premios el premio a al excelencia investigadora postdoctoral de la facultad de de Ciencias de la Vida de QUB (2020) y del Vicerrector de QUB (2022).

Esto me llevó a obtener una beca Miguel Servet y un Plan de Generación del Conocimiento en 2022, estableciéndome como investigadora principal en ISABIAL y el Instituto de Neurociencias CSIC-UMH. Mi objetivo a largo plazo es desarrollar un programa de investigación que profundiza el conocimiento de la biología de los OPCs aunando conocimiento del campo de células madre, neuroinmunología regenerativa y neurociencias para avanzar en el

conocimiento de la reparación cerebral, con el objetivo de disminuir y controlar los efectos perjudiciales de la inflamación crónica y potenciar la regeneración de la mielina. Esto contribuirá a la comprensión de la patogénesis, progresión y reparación de diversas enfermedades degenerativas.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Biomedicina
**Nombre:** GONZALEZ LOYOLA, ALEJANDRA
**Referencia:** RYC2023-042926-I
**Correo Electrónico:** alejandragloyola@gmail.com
**Título:** Tackling tumor progression from a biomechanical and vascular view: A multiplidisciplinary therapeutic strategy

## Resumen de la Memoria:

My research career has been multidisciplinary due to my intrigue to develop new cancer therapeutics and thus, with this purpose I have combined the fields of vascular biology and tissue engineering. Therefore, for my postdocs I have chosen different types of research and centres to make use of the last technological approaches and in vivo and in vitro models to better understand and treat tumor progression. I have advanced the cancer field thanks to finding promising therapeutic strategies to be applied in colorectal cancer and others.

During my PhD at CNIO as FPI fellow, I elucidated the novel oncogenic function of Aurora cell cycle kinases (Development, 2011, Mol.Cell Biol, 2015) and I contributed to the discovery of the role of the Polo-like kinase 1 in sustaining cardiovascular homeostasis (Nat.Med.,2017). In 2015 I started my postdoctoral stay in the group of Prof. Tatiana Petrova at the University of Lausanne. During this period, I co-authored 8 papers (3 of them as first author and 5 as second/third), I received my own funding for research from Swiss foundations (University of Lausanne, Union of Swiss Society of Vascular Research) and I led two lines of research. In the first project, using genetic animal models, scRNA-seq and metabolomics approaches I characterized the organ-specific and systemic effects of dysfunctional intestinal lymphatics and their interplay with gut microbiota (Sci.Adv., 2021). In the second project, I identified that the transcription factor c-MAF is a novel regulator of intestinal villus zonation program (JEM, 2022). I also contributed to studies of anti-angiogenic and immune therapies for treatment of colon cancer (JCI, 2020) and the cross talk of blood vasculature and intestinal stem cells (Nat. Cardiov.Res, 2022). I collaborated with T.Makinen (Sweden) in analysing the role of transcription factor FOXP2 in lymphatics (EMBO J, 2021) and Carola Ries (Roche) in identifying the mechanism of side effects of CSF1R inhibitors (STM 2021). I am also first author of the invited review on the role of lymphatic vessels during development and aging (Adv. Drug Delivery Rev., 2021) and a co-author of the review on the functions of intestinal vasculature (J. Exp. Med., 2024).

I have published 15 high impact peer-reviewed articles (5 first author and 1 paper as corresponding author and I have two collaboration papers ongoing (F. Kiefer lab, Germany, revision in Cell and group of K. Alitalo, Helsinki, in Cancer Research) and I have made over 20 communications to international conferences, three of them as invited speaker.

Thanks to a highly competitive Maria Zambrano Fellowship for Attraction of International Talent I joined in 2022 as senior scientist the M2BE lab at the University of Zaragoza, runned by Professors María Ángeles Pérez Ansón and José Manuel García Aznar (APL Bioengineering, 2023). At the moment, I work at IIS Aragón thanks to obtaining a Seal of Excellence Health-ISCIII (163.728,68€), funding that covers my salary and research project on developing new therapeutic strategies to tackle pancreatic cancer progression. A PhD student and a TFM, who I co-direct, are working on this project, thus showing my seniority level. Obtaining a Ramon y Cajal Fellowship will help me to be established as renowned scientist in the field.

## Resumen del Currículum Vitae:

I am a scientist with 17 years of research experience. My expertise is in cancer therapeutics, vascular biology, stem cells and bioengineering. My main research interest is to decipher new biomechanical strategies to tackle pancreatic tumor progression.

I graduated in Biology and Biochemistry at the University of Salamanca (BSc, top 5% in class) and completed my first research project during my 4th-year and an extra project at the University of Manchester with an Erasmus scholarship. In 2009 I performed my MSc at Vall d' Hebron Research Institute, Barcelona (PFIS fellow). In 2010 I started my PhD as FPI fellow in Prof. Marcos Malumbres' lab at CNIO, Madrid, where I obtained a strong background on molecular biology and animal models of cancer. I did a short-term PhD stay at MRC Imperial College London as EMBO fellow, where I studied the role of Aurora kinases in stemness potential. At the end of my PhD, I was interested in tumor microenvironment therapies. This interest led me to perform my postdoc in Prof. Tatiana Petrova' s lab (2015-2021) at the University of Lausanne. This period gave me the knowledge and expertise on vascular biology, tumor microenvironment and cancer therapies. During this period, I published 8 high-impact peer reviewed papers (3 as first-author) and I was invited to give seminars in 3 conferences and had 5 oral presentations at international conferences. I attracted funding from Swiss institutions (University of Lausanne, Union of Swiss Vascular Societies and I have received multiple awards such as the Award of Excellence to the Young Researcher at the University of Lausanne.

In 2022 after obtaining a highly competitive, Maria Zambrano Fellowship I started working as Senior Scientist at the University of Zaragoza on the fabrication of human microvascular networks in innovative microfluidic devices. As part of this research line, I have a paper as corresponding author in APL Bioengineering, 2023. I also joined ICOMICs (H2020 ERC Advance Grant) project and VASTO (ERC-Proof of Concept) led by Prof. José Manuel García Aznar. In 2023 I obtained my funding from European Funds MSCA-Seal of Excellence ISCIII-HEALTH, 163.728,68€ to perform my research objective of developing novel strategies to modulate tumor mechanoenvironent to block cancer progression. And I co-direct a PhD and a TFGM student working in this project.

I assumed the risk of starting transversals fields, all related to cancer therapeutics. Few groups in Spain have expertise in the lymphatic vasculature field so far and my background on this field together with that of cancer research and bioengineered microfluidic devices makes a quite unique multidisciplinary background to develop challenging projects. Through my career, I have participated in 16 research projects at the national and

EU/international level that have helped to expand my network. Besides, I have actively disseminated my research in the media. I have supervised a BSc, 5 MSc and 2 PhD students (University of Lausanne, Switzerland, University of Zaragoza). I am also a regular reviewer of articles in JCR indexed journals in the fields of cancer therapeutics, stem/vascular biology and bioengineering and I have experience as a member of scientific committees, conference organizer and chair of international conferences.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

**Área Temática:**    Biomedicina
**Nombre:**    PERURENA AIZCORBE, NAIARA
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**Correo Electrónico:**    nperurena@alumni.unav.es
**Título:**    Developing therapeutic strategies to combat resistance in metastatic cancer

**Resumen de la Memoria:**

My research has mainly focused on breast and Ras-driven cancers: 1) Elucidating mechanisms that drive metastasis, 2) Identifying new therapeutic targets and mechanisms of resistance, and 3) Developing combinatorial therapeutic strategies to combat resistance.

Metastasis is responsible for over 90% of cancer-related deaths. Therefore, it is essential to identify the drivers of this biological process in each tumor type. My PhD work at University of Navarra/CIMA unveiled endothelial protein C receptor (EPCR) as a key regulator of the metastatic process in breast and lung cancers and characterized distinct mechanisms by which this gene exerts its functions in these tumor types (Perurena N et al. J Hematol Oncol, 2017). I also contributed to the identification of additional drivers of metastasis: overexpression of HDAC4 and PITX1, and activation of C5a/C5aR1 signaling in lung cancer; FGFR1/MAPK signaling, and Matrix-Gla Protein (MGP) overexpression in osteosarcoma; upregulation of ENPP1, and induction of neutrophil extracellular traps (NETs) in breast cancer. This work resulted in 1 first author and 7 co-author original papers and 1 co-first author review.

Ras signaling is one of the most frequently deregulated pathways in cancer. During my PhD, I discovered that KRAS-driven lung and pancreatic tumors selectively depend on a mitotic program regulated by FOSL1 for survival and growth and that targeting this program with AURKA inhibitors promotes tumor regression in combination with MEK inhibitors (Vallejo A*, Perurena N*, Guruceaga E* et al. Nat Commun, 2017; *Co-first). During my postdoctoral training at Harvard Medical School (HMS) and Brigham and Women's Hospital (BWH), I found that pancreatic cancers rapidly adapt to MEK inhibition by stabilizing the anti-apoptotic protein MCL1, rendering these tumors resistant. I further showed that co-targeting MCL1 with direct inhibitors or transcriptional CDK inhibitors that suppress MCL1 transcription results in potent and sustained tumor regression in xenograft, PDX and GEMM models (Perurena N et al. Cell Rep Med, 2017), providing promising therapeutic strategies for this intractable disease. As a junior faculty at HMS/BWH, I have discovered a non-genetic mechanism of resistance to HER2 inhibitors in breast cancer: loss of the RasGAP DAB2IP. I am currently working on deconstructing the precise signals that drive this phenotype and using this insight to develop therapeutic strategies to combat resistance in DAB2IP-deficient tumors (first author paper in preparation).

Developing combination therapies is also an effective strategy to induce deeper initial responses and prevent resistance. We recently reported that combining KRAS G12C and eIF4A inhibitors is synergistic in MYC-dependent KRAS-mutant lung cancers (Nardi F, Perurena N et al. JCI, 2023). In addition, I have developed three combination therapies based on co-targeting epigenetic and oncogenic pathways in HER2+ and triple-negative breast cancers, and KRAS-mutant colon cancer (2 co-author papers under review, 1 first author paper in preparation).

As an independent researcher, my goal is to study 1) mechanisms that drive drug tolerance and therapeutic resistance, 2) understand how these mechanisms of resistance differ by organ/site of metastasis, and 3) use this insight to develop combinatorial strategies to improve therapeutic responses.

**Resumen del Currículum Vitae:**

I am an Instructor in Medicine (junior faculty) at Harvard Medical School (HMS) and Brigham and Women's Hospital (BWH). My goal is to elucidate the mechanisms that drive therapeutic resistance in breast and other cancers and apply this insight to develop rational combination strategies.

After studying Pharmacy (Extraordinary Award), I earned my PhD in Cellular and Molecular Biology (Cum Laude, International Doctor) from the University of Navarra, funded by a FPU fellowship (Spanish Ministry of Education). My work identified and characterized a novel pro-metastatic receptor (EPCR) in breast cancer (Perurena N et al. J Hematol Oncol, 2017), and was recognized with the Extraordinary Doctoral Award and the ECTS-IBMS New Investigator Award. I collaborated in 6 other projects to characterize additional molecular drivers of metastasis and recurrence in breast and lung cancers, and osteosarcoma (6 co-author original papers and 1 co-first author review). Funded by a short-term FPU mobility fellowship, I joined Cold Spring Harbor Laboratory for 3 months as a visiting graduate student, where I contributed as a co-author to a seminal paper (Sci Transl Med) that unveiled the role of NETs in metastasis. During my training at CIMA, I also identified FOSL1 as a key downstream effector of mutant KRAS in lung and pancreatic cancers (Vallejo A*, Perurena N*, Guruceaga E* et al. Nat Commun, 2017, *Co-first).

Next, I joined the laboratory of Dr. Cichowski at HMS/BWH as a postdoctoral fellow. I identified an important adaptive mechanism of resistance to MEK inhibition in pancreatic cancer and I developed two combinatorial strategies (with direct Mcl-1 inhibitors or transcriptional CDK inhibitors) to overcome this resistance (Perurena N et al, Cell Rep Med 2023). Importantly, I am working with a company to translate these results into a clinical trial. In 2021, I was promoted to Instructor in Medicine (junior faculty) and I am currently leading two projects independently to understand and combat resistance in HER2+ breast cancers (2 first and co-corresponding author papers in preparation), with funding secured from 3 competitive grants as a PI (AACR-AstraZeneca Breast Cancer Research Fellowship, Terri Brodeur Breast Cancer Foundation Award, METAvivor Early Career Investigator Award). I have also participated as a team member in projects funded by NIH, DoD and Cancer Grand Challenges (NIH, CRUK) and I am an author in 5 additional papers (2 second author papers in JCI and Cancer Research, and 3 papers under review: 1 second author paper in Nature, 1 co-author paper in Cancer Discovery, 1 co-first author review in Nature Reviews Cancer). Overall, I have published 13 papers (4 as first/co-first author) and have 3 papers under review.

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I am involved in multiple regular meetings across the Harvard community (Cancer Signaling, Genetics Research in Progress, Ludwig Cancer Center, HER2 Working Group - Breast Oncology program), and I have been a speaker at >10 international conferences and invited seminars. During my PhD I was a teaching assistant in the laboratory program of Clinical Biochemistry at the University of Navarra (2011-2015). I have supervised and mentored 1 graduate student, 2 technicians and 1 undergraduate student in the Cichowski Lab and I am a mentor of 2 graduate students in Spain through the International Mentoring Program organized by IMFAHE.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | DJUKOVIC , ANA |
| **Referencia:** | RYC2023-042654-I |
| **Correo Electrónico:** | adjukovic@gmail.com |
| **Título:** | The role of gut microbiota in health: from protection against opportunistic pathogens to microbiota-host metabolic crosstalk |

**Resumen de la Memoria:**

During my Ph.D. thesis with Dr. Carles Ubeda at The Foundation for the Promotion of Health and Biomedical Research of Valencia Region (FISABIO), Spain, I combined experiments in mice and multi-omic analysis of fecal samples from acute leukemia patients to investigate how our gut microbiota prevents gut colonization by multidrug-resistant Enterobacteriaceae (MRE). My results uncovered species-species interaction within gut microbiota leading to production of short-chain fatty acid butyrate that restricted MRE gut colonization both in mice and humans, being this one of the first studies to show a mechanism of protection in humans.

For my postdoc, I joined the group of systems biologist Dr. Joao Xavier at Memorial Sloan Kettering Cancer Center (MSKCC), USA. Here, I collaborated with clinicians and computational biologists to analyze a vast sample bank containing over 10,000 fecal samples from more than 1,000 hematopoietic stem cell transplant patients. We developed the novel TaxUMAP method to better visualize this large dataset. By applying the TaxUMAP, and performing in vitro and in vivo experiments, I identified gut bacteria competing with enteric pathogens and associated with reduced risk of bloodstream infections in these patients. I also investigated the mechanisms behind the increase in relative abundances of oral bacteria in feces of individuals suffering from different intestinal disorders. Through a series of experiments on mice, I showed that the increase in relative abundance of oral bacteria in feces stems from depletion of the gut microbiota. These findings suggest that the oral bacterial fraction in feces might be a biomarker of gut microbiota dysbiosis.

During my postdoc my interests expanded towards exploring the host-gut microbiota interaction. I initiated a project to study how gut microbiota affects host's tryptophan metabolism, and vice versa, and the implications of this interplay on cancer progression. My preliminary results indicate that the gut microbiota can influence the kynurenine pathway, one of the main tryptophan metabolic routes. Alterations in kynurenine pathway have been associated with unfavorable prognoses and resistance to therapeutic interventions in several cancers. Consequently, unraveling the mechanisms by which the gut microbiota impacts tryptophan metabolism holds significant potential for the development of microbiota-based anticancer therapies. I aim to continue developing this line as independent principal investigator. My approach, described in the proposal, involves a multidisciplinary strategy, incorporating in vitro, in vivo, and ex vivo experiments, and the analysis of multi-omic data. The goal is to identify specific bacteria and metabolites that mediate the crosstalk between the host and the microbiota in the context of tryptophan metabolism. Furthermore, I aim to investigate this dialogue in cancer cells to bridge the gap between basic science and clinical applications and facilitate the design of microbiota-based therapies that may prove promising in the ongoing battle against cancer.

**Resumen del Currículum Vitae:**

I completed my B.Sc. (average mark 9.33/10) and M.Sc. (average mark 9.62/10) studies in Biology at the University of Belgrade, Serbia, supported by scholarships from the Ministry of Education. After that, I joined the group of Dr. Carles Ubeda at The Foundation for the Promotion of Health and Biomedical Research of Valencia Region (FISABIO), Spain, initially for my master's thesis project and later to pursue a Ph.D. There, I investigated the role of the gut microbiota in protection against gut colonization and infections with opportunistic pathogens. Preliminary results from experiments and analyses I conducted were part of the successful research proposal that obtained funding through the ERA-NET Infect-ERA under the Seventh Research Framework Programme. During this project, that involved participation of six laboratories across Europe, I established a comprehensive biobank comprising over 1,000 fecal samples from acute leukemia patients, and I coordinated the transfer of the results and materials between clinicians from The University and Polytechnic La Fe Hospital of Valencia, Spain, and other participating groups. As an addition to my Ph.D. training, I conducted a four-month research stay in the laboratory of systems biologist Dr. Joao Xavier at Memorial Sloan Kettering Cancer Center (MSKCC), New York, funded by the Boehringer Ingelheim Fonds Travel Grant. My Ph.D. thesis, for which I got the recognition cum laude, resulted in 10 publications, with three as the first author, and the most substantial one in Nature Communications.

Following the completion of my Ph.D., I joined Dr. Joao Xavier's group to advance my knowledge in computational analysis of complex microbiome datasets. During my postdoc at MSKCC—one of the world's leading centers for cancer research—I participated in two projects investigating different aspects of the gut microbiota biology. Here, I collaborated with highly regarded microbiome experts, computational biologists, and clinicians, which led to two co-first author papers, one of which has been published in Cell Host & Microbe, while the other is currently (Jan. 2024) undergoing its second round of revisions in Nature Microbiology.

While in Dr. Xavier's group, I became interested in gut microbiota-host interplay facilitated through tryptophan metabolism and its implications on cancer progression. I introduced this topic as a new research line and, with Dr. Xavier, co-wrote a successful grant proposal that secured funding through the Basic Research Innovation Award Pilot Project Grant. Apart from my research activities, I spearheaded the establishment of an animal protocol and introduced the utilization of mouse models, previously absent in the Xavier group, significantly contributing to the ongoing and future research.

Throughout my academic career I have conducted several international research stays, and participated in various projects that involved collaboration of research groups from different countries. Results from my work have been published in high-impact journals and presented in various national and international conferences. In 2022 I took a five-month career break following the birth of my son.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | TAPIA ABELLÁN, ANA |
| **Referencia:** | RYC2023-043193-I |
| **Correo Electrónico:** | anatapiaabellan@gmail.com |
| **Título:** | Molecular mechanisms behind macrophage-associated inflammation |

**Resumen de la Memoria:**

I focused my scientific career on innate immunity and inflammation. I studied the macrophage regulation and functionality using immunological, biochemical, molecular and cell biology methods. During my PhD I studied the role of peritoneal macrophages obtained from the ascites fluid in a human pathological scenario, the decompensated hepatic cirrhosis. Since my first postdoc, I am fascinated by the inflammasomes; intracellular multiprotein complexes mainly expressed in macrophages that govern the processing and release of pro-inflammatory cytokines that belong to the IL-1 family. In this sense and in line with the research to be developed, I would like to explore the most intriguing inflammasome NLRP3. NLRP3-dependent inflammation is specifically associated with many physiological and pathological conditions in humans ranging from infections to Alzheimer's disease and punctual mutations in the NLRP3 gene are responsible for human autoinflammatory syndromes named as CAPS (Cryopyrin-associated Periodic Syndromes). Thus, elucidating the mechanism of NLRP3 inflammasome activation has been a research priority. NLRP3 is activated from microorganisms to sterile danger signals but its direct ligand remains enigmatic. Despite of this, potassium (K+) efflux seems to be the minimum requirement to produce its activation but how NLRP3 senses K+ is largely unknown. Moreover, NLRP3 structure and subcellular localization have been recently described as critical determinants of its activation. How NLRP3 mediates its structural conformational change to get activated, how ADP/ATP nucleotide exchange affects this process and where NLRP3 is precisely located during different conformational activation states remains unsolved. Additionally, I have recently shown that NLRP3 follows two different activation pathways in macrophages: a membrane-dependent and independent one (https://www.biorxiv.org/content/10.1101/2023.07.07.548075v1) but its physiological relevance needs to be clarified. To address these questions, I propose the following objectives:

1. Explore whether NLRP3 is a direct K+ sensor solving one of the most important question regarding NLRP3 activation. Here, primary macrophages, NLRP3-expressing macrophages-derived cell lines, reconstituted NLRP3 cell lines (e.g. S2 macrophage-like cell lines from Drosophila melanogaster) and purified NLRP3 proteins will be used. We will work with different K+ containing buffers and perform enzymatic assays, mass spectrometry and calorimetric assays.

2. Study the importance of ADP/ATP exchange during NLRP3 activation. Here, several inflammasome activation assays will be performed in the presence of the non-hydrolyzable ATPγS.

3. Analyse the physiological relevance of the membrane dependent and independent activation pathways in other NLRP3-expressing cells such as neutrophils and describe the predominant pathway in CAPS (currently >200 mutations). Here, among others we will perform live cell imaging experiments in the presence of several cellular transporter inhibitors.

I firmly believe that with my expertise I will elucidate these objectives and possibly identify new and targetable facets of NLRP3 for future drug development

**Resumen del Currículum Vitae:**

I hold 18 scientific publications, 8 in the top 10 journals of their respective research fields, accumulating more than 800 citations and an h-index of 13. I obtained competitive scholarships to pursue my dissertation. During my PhD, I published 7 research articles, 4 as the first author. My research was focused on the study of the inflammatory activation state of peritoneal macrophages obtained from ascites in patients suffering from decompensated hepatic cirrhosis. This thesis obtained the extraordinary doctorate award in 2015. Then, I got a postdoc contract in an ERC Consolidator project, publishing 7 articles, 2 as first author in Nat. Chem. Biol. (IF=12.2, D1) and Sci. Adv (IF=14.1, D1) journals and a book chapter. I centred my studies on the NLRP3 inflammasome, a multiprotein complex responsible for the processing and release of IL-1 family inflammatory mediators that is involved in human chronic inflammation and autoinflammatory syndromes. In 2019, I moved to Germany as a senior postdoc and project leader. Here, I have independently conceived 4 projects obtaining around 400K euros in total. In terms of publications, I am the last and corresponding author of a manuscript describing two NLRP3 activation pathways: TGN/MTOC-dependent and independent, currently under review in Mol. Cell (IF=19, D1). The PDF of the preprint has been downloaded 664 times (doi: https://doi.org/10.1101/2023.07.07.548075); co-authorship in 3 papers, one describing the key role of the Bruton tyrosine kinase in NLRP3 regulation (published in JEM, IP=17, D1) and two analysing the blocking effect of an NLRP3 inhibitor in the blood from patients carrying NLRP3 gain-of-function mutations. In addition, I am the last author of an NLRP3 review. I participated in more than 20 national and international congress, circa half of them selected as oral communications (2 awarded) and a chairwoman in 2. I was a delegate of the COBRM in Germany to support Spanish students. Actually, I am vicechair of the Talent Academy of the University of Tubingen. I am part of the Genome Editing to Treat Human Diseases project funded by the EU COST Action program. I have a scientific collaboration with Novartis investigating the effect of different reagents on the structure of purified NLRP3 proteins. I supervise/d 2 PhD students, 1 research assistant, 1 Master's and 1 Bachelor¿s thesis, and 4 student assistants. I evaluated 2 Doctoral thesis and 3 Master theses. I have strong expertise in molecular biology, cellular biology, immunology and biochemistry techniques. I further improved my skills thanks to the Felasa C, cell culture, biosafety, GraphPad, Scientific Communication, Advance writing, Good Scientific Practice for supervisor courses among others. I obtained the 'Certificado de Aptitud Pedagógica'. During my PhD, I taught Immunology in the Biochemistry, Biology, Odontology and Medicine degrees in the University of Murcia thanks to my Venia Docendi. I got the Assistant Lecturer accreditation (ANECA). Since 2020, I hold Immunology seminars at the University of Tübingen.

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| **Área Temática:** | **Biomedicina** |
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| **Título:** | Neuron-glial network dynamics in development and cancer |

**Resumen de la Memoria:**

Spontaneous activity is a hallmark feature of the developing brain, and it consists of highly correlated activity across groups of nascent neurons. Patterned spontaneous activity occurs before the brain is ready to respond peripheral stimuli, and is thought to configure future connections by providing a template for evoked activity. I dedicated the last years of my career to the study of this unique form of activity and its role in the early establishment of cortical circuits. I developed a technique to image the intact brain of awake mice at embryonic and early postnatal stages. Using this technique, we have been able to perform whole-scale calcium imaging in real time of both spontaneous and evoked neuronal activity. With this approach we demonstrated, for the first time and in vivo, that the somatosensory cortex contains a functional map of the periphery already at embryonic stages (Anton-Bolanos et al. Science, 2019). More recently, we unveiled a developmental mechanism by which the visual and somatosensory modalities, which emerge intermingled, separate to become independent. This mechanism is dependent on the arrival of spontaneous retinal waves to the superior colliculus, where the segregation takes place (Guillamon-Vivancos et al. Science, 2022). Although recent decades have witnessed significant advances in the understanding of how neuronal spontaneous activity instructs the formation of neural circuits, it remains unknown whether glial cells also display this kind of activity. Thanks to the Caixa Junior Leader Fellowship, I am investigating wide-scale patterns of spontaneous activity in astrocytes.

Brain cancer, which can be considered a disease of dysregulated development, often co-opts mechanisms of neural development to achieve brain invasion. It has been very recently discovered that neuronal activity promotes tumor growth and, in turn, cancer cells can secrete factors that alter neural function. Intriguingly, cancer networks display patterned activity in the form of calcium waves that propagate across interconnected tumor cells. This rhythmic activity is reminiscent of the spontaneous activity that emerging neurons exhibit in the developing brain. Despite recent advances in the field, cancer-driven activity has not yet been visualized at the wide scale in vivo, and whether the activity of non-neuronal types is modified by this disease remains unknown. As I have made important contributions to Developmental Neuroscience, I now want to use this approach to brain cancer. Thanks to the Caixa Foundation and the AECC, I started to investigate how cancer cells change spontaneous activity.

In this project, I propose to interrogate whether oligodendrocyte precursor cells (OPCs) show wide-scale patterns of spontaneous activity during development. I also plan to study whether wide-scale activity is altered in vivo in a mouse model of brain cancer to determine: i) what circuits and cell types are preferentially affected and ii) whether such changes correlate with and can inform disease progression. I will perform perturbations of neuronal and glial activity patterns to try to modify tumor progression. My work will uncover currently unknown network dynamics of OPCs and their role during development. The results of this project may also open new avenues for earlier diagnosis, treatment and surveillance of brain cancer progression.

**Resumen del Currículum Vitae:**

During my PhD at Boston University, I studied how neural progenitors contribute to the cellular diversity of the neocortex. Using techniques like patch-clamp or high-resolution confocal microscopy, we found that the different lineages of progenitors modulate the characteristics of their daughter neurons by conferring specific morphological and electrophysiological properties on them. We also discovered that neurons from different lineages even differ in the number and location of thalamic synapses (Tyler et al, J Neurosci 2015 and Guillamon-Vivancos et al. Cerebral Cortex, 2019). I became interested in how thalamic input influences the development of the neocortex and, by the end of 2017, I joined the laboratory of G. López-Bendito, a leading expert in the field, for postdoctoral training.

During my postdoctoral training, I developed a technique to image the intact brain of awake mice at embryonic and early postnatal stages. Using this technique, we were able to perform whole-scale calcium imaging in real time of both spontaneous and evoked neuronal activity. With this approach we demonstrated, for the first time and in vivo, that the somatosensory cortex contains a functional map of the periphery already at embryonic stages (Anton-Bolanos et al. Science, 2019). More recently, we unveiled a developmental mechanism by which the visual and somatosensory modalities, which emerge intermingled, separate to become independent. This mechanism is dependent on the arrival of retinal waves to the superior colliculus, where the segregation takes place (Guillamon-Vivancos et al. Science, 2022).

Recent advances showing that neural activity regulates development, together with the fact that cancer is essentially a disease of dysregulated development, suggest that an interplay between brain activity and cancer may play a key role in pathogenesis of this brutal disease. Since I have made important contributions to Developmental Neuroscience, I want to apply this same technique to advance in the burgeoning field of Cancer Neuroscience. I have received the Caixa Junior Leader Fellowship 2023 and the Idea Semilla 2023 from the Asociación Española Contra el Cáncer to pursue this research. To achieve this goal, I am currently collaborating with Dr. Valiente at the CNIO, a leading expert in the field of brain metastasis.

In terms of teaching, I did more than two hundred hours of teaching at the Boston University School of Medicine. I was Teaching Assistant first, and then an Instructor for the General Anatomy and Neuroscience courses at the Medical school. Upon my return to Spain, I have been a member of the selection committee of the Fulbright Commission for scholarships for extension studies, and the advisory committee of the Master's in Neurosciences at the International University of Valencia. Regarding outreach activities, I have participated, in the Brain Awareness Week organized by the Institute of Neurosciences, and I am a member of the Rafael del Pino Club of Scientists, which organizes conferences and seminars to disseminate and promote

science in Spain. To promote female leadership, I have participated as a speaker in the conferences organized for the Day of Women and Girls in Science, and I have collaborated with Inspiring Girls, a foundation whose objective is to promote the professional aspirations of girls around the world.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** **Biomedicina**
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**Título:** Novel natural approaches to a topical vaginal microbicides against HIV and other sexually transmitted diseases

## Resumen de la Memoria:

The main research lines I have pursued in my research career have focused on the use of nanotechnology against infectious diseases and its mechanism of action against virus-host interplay, as well as of the studies of Elite controllers, HIV multidrug-resistance and combination drug therapy to develop better HIV treatments. My work focused on microbicide development, moving then to HIV-1 treatments and biomaterials, has generated relevant knowledge in both fields. I am co-author of 21 published scientific papers, being the first author of 13 of them and corresponding/last author in 4. I hold a degree in Biology and Biochemistry and a MSc in Biostatistics (distinction). During my PhD (Universidad Autonoma de Madrid, Spain, 2017, no corrections) my main achievements were to perform preclinical studies with nano-compounds as prophylaxis against sexually transmitted viruses and publishing this work, with first authorships, in high impact journals (Journal of Nanomedicine 2016, 2017 & 2019, Nanoscale 2017, European Journal of Pharmacology 2017).

Since 2019, I belong to the research group lead by Prof Anders Sönnerborg at Karolinska Institute (Stockholm, Sweden), where I focus on studying HIV-1 Elite controllers and new antiviral compounds to improve HIV treatment and finding a cure. I have increasingly gained independence and leadership, while maintaining a high level of internationalization. I have become a Team Leader (antivirals team) which encompasses two additional junior postdocs. I have lead studies which identified candidates for HIV-1 treatments as corresponding author (Infectious diseases and Therapy 2021, International Journal of Antimicrobial Agents 2023, Drug Resistance Updates 2023 and Frontiers in cellular and infection microbiology 2024), and I have started my own research line, while establishing several international collaborations, in the context of HIV microbicides and biomaterials, to study their preclinical potential and translation to clinic. I have received funding as a PI from Swedish physicians against AIDS Research fund (700,000 SEK), Stiftelsen Lars Hiertas Minne (140,000 SEK) and Karolinska Institutet Research Foundation (254,000 SEK) to study naturally occurring dipeptides in Elite controllers. I have also participated in other research projects, Swedish Research Council 2020-2023 (4,500,000 SEK) and CIMED 2022-2023 (3,000,000 SEK). I am co-applicant and junior PI in an international research consortium awarded with Pathfinder European Innovation Council (EIC) grant (3 million €) in which I am alo member of the management board.

Additionally, I am part of two more international consortia: EuResist on HIV drug resistance originating from a FP6EU project with the largest database globally on HIV resistance sequences together with clinical information, and CARE a EUH2020 sponsored project studying HIV, TB, hepatitis in Eastern Europe and Russia.

I have successfully supervised one MSc and two BCs international projects.

In 2023, I placed 6th in reserve in Ramon y Cajal grant, and I obtained the R3 certificate as established researcher.

## Resumen del Currículum Vitae:

I joined the Laboratory of molecular immunobiology lead by Dr. Muñoz-Fernandez at Research Institute of Gregorio Marañon Hospital (Madrid) to pursue a PhD after completing my MSc. My predoctoral research focused on development of nanotechnology as prophylaxis against sexually transmitted viruses, demonstrating the ability of dendrimers to inhibit HIV and HSV infections, its mechanism of action and its tolerability, biodistribution and effectiveness in-vivo. During this period, I enjoyed a research contract as part of a R&D project of Fondo Investigación Sanitaria (PI13/02016), defended my doctoral thesis (Universidad Autonoma of Madrid 2017 "Polyanionic carbosilane dendrimers against viral infections: HIV-1, HSV-2 and RSV") and participated in the establishment of a new research line to develop 3D complex organoids by co-culturing organoids with immune cells. My predoctoral research work resulted not only in multiple publications in prestigious journals such as International Journal of Nanomedicine, Nanoscale, European Journal of Pharmacology or Polymers but also a patent (P201600726: Carbosilane dendrons functionalized with fatty acids: Formation of micelles and uses in biomedicine as antivirals, antibacterials, antiprionics, antimicrobials and drug carriers).

In 2017, I spent 4 months at Leibniz Institute of Polymer Research (Dresden, Germany) to increase my knowledge on inorganic chemistry and synthesis, modification, characterization of polymers, which was later further developed during 2021-2022 during my postdoctoral research with Dr. Hongji Yan at Royal Institute of Technology (Stockholm, Sweden).

In 2019, I moved to Sweden as a Postdoctoral Researcher at Karolinska Institutet (Stockholm, Sweden). I am focused on the study of infectious diseases, particularly HIV, using experimental, translational and clinical research to study HIV treatment and finding a cure. I have started my own research line, while establishing numerous international collaborations, in the context of HIV microbicides and biomaterials, to study their preclinical potential and translation to clinic. My postdoctoral work has so far resulted in publications in highly prestigious journals, including one articles in Advance science (IF: 17.52) as first author, and three papers as first and corresponding author in Infectious diseases and Therapy (IF: 6.11), Drug Resistance Updates (IP=22.82) and International Journal of Antimicrobical Agents (IP=15.44). I have obtained funding in Sweden to lead my own projects in HIV/AIDS research (Swedish physicians against AIDS Research fund, 700,000 SEK, Stiftelsen Lars Hiertas Minne, 140,000 SEK and KI Research Foundation, 254,000 SEK. In 2023, the international (5 European countries) consortium I belong obtained Pathfinder EIC grant (3 million €). I also obtained the R3 certificate as established researcher.

Moreover, I have co-supervised one MSc international projects (Joana Filipa Furtado Milão, 2021, Uppsala University, Sweden) and 2 BSc projects (George Gourgi, 2020, and, Lukas Derhaschnig, 2022, Wein, Austria).

As a result of my research, I have participated in 16 research projects (principal investigator in 7), presented my work in 24 scientific meetings, and co-authored 21 publications (10 of them Q1, including 11 D1), being the first author of 13 of them (13 in Q1; including 7 in D1) and corresponding author in 4.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | MARTÍNEZ RIAÑO, ANA |
| **Referencia:** | RYC2023-042880-I |
| **Correo Electrónico:** | anatinez@gmail.com |
| **Título:** | Cellular and molecular mechanisms regulating antigen display and acquisition during the humoral response |

**Resumen de la Memoria:**

I have been working in the immunology field for over 13 years. I did my PhD at Prof. Balbino Alarcón laboratory (Centro de Biología Molecular Severo Ochoa, Madrid) and my postdoctoral studies with Prof. Pavel Tolar (The Francis Crick Institute/University College of London, UK) and Prof. Ignacio Melero (Centro de Investigación Médica Aplicada, Pamplona). Since my initial steps as a scientist, I have developed successful studies characterising both the humoral and cellular arms of the adaptative immune system. Because of the broad range of topics in which I have been working, I have gained the knowledge and technical skills to study processes such as T cell activation, B cell humoral responses, stromal-immune interactions and tumor immunotherapy. During my PhD at Prof. Balbino Alarcón laboratory, I analysed the role of RRas2 GTPase on T cell development. Using biochemical assays, in vitro thymocytes cultures and autoimmune disease mouse models, I described the role of RRas2 modulating the threshold for TCR-induced apoptosis during thymocytes development (Martinez-Riano, A. et al. 2019, J Exp. Med). During my PhD I also described the ability of follicular B cells to acquire antigens by phagocytosis in vivo in a cognate-manner (Martinez-Riano, A. et al., 2018. EMBO Rep). This novel mechanism for antigens acquisition, which is dependent of RhoG GTPase and induces a more sustained B cell receptor signalling, led to the generation of an in vitro germinal centre culture system with the potential to produce high-affinity antibodies for antigens of clinical interest (Martinez-Riano, A. et al. 2023. Commun. Biol.; Patent application number PCT/EP2019/080990). In 2018, after finishing my PhD, I joined the laboratory of Prof. Pavel Tolar, expert on B cell immunity. My interest resided in understanding how B cells are being stimulated in vivo during the germinal centre response. To do that, I built up in the lab the technics to analyse the B cell follicle stromal compartment and their spatial organisation. I did that by establishing a network of collaborators experts on stroma-immune interactions and using the state-of-the-art tools. Specifically, I described that the spatial organization of the Follicular Dendritic Cell (FDC) network regulates the antigen dynamics in the germinal centre (Martinez-Riano, A. et al. 2023. Nat. Immunology), while the entire FDC network captures antigens initially, only the central cells of the network function as a long-term antigen reservoir. These differences are driven by the differential expression of Complement receptor 2 between the FDC populations. This research line has provided with a deep characterisation of the FDCs and revealed key information for the generation of novel vaccines aiming to induce long-lasting B cell responses. Importantly, it has opened new questions about the biology of the FDCs and the immune-stromal crosstalk under vaccination schemes but also under pathophysiological conditions such as cancer, which I am planning to investigate thanks to the expertise in murine tumour models acquired during my postdoc in Melero's lab. The intratumoral organisation of the immune cells in tertiary lymphoid structures correlates with a better disease prognosis in many types of solid tumors, therefore, to understand the cues that support their organisation is essential to design new anti-tumoral therapies.

**Resumen del Currículum Vitae:**

I studied Biology at Pompeu Fabra University (Barcelona). During those years (2005-2010) I did different internships at national and international research centres (Tromso University- Norway; Inbiomed-San Sebastián; Sir William Dunn School of Pathology/Oxford University – UK). During my BSc final project at Prof. Oreste Acuto lab (Oxford University), I collaborated in the characterisation of Themis, a new described protein, on T cells. I defined the recruitment of Themis to the TCR signalosome upon stimulation (Paster, W. et al. 2013. J Immunol). Afterwards, I continued my studies at Pompeu Fabra University, where in 2011 I did the MSc in Biomedical Research. During that year, I moved to Madrid to the laboratory of Prof. Balbino Alarcón (Centro de Biología Molecular Severo Ochoa), expert on T cell signalling, where I undertook my MSc project and PhD training. There, I worked in several challenging projects analysing T cell activation, thymocyte development and antigen-stimulation to B cells, which led to 3 first-author publications, 3 co-author papers and a patent (Martinez-Riano, A. et al., 2018. EMBO Rep; Martinez-Riano, A. et al. 2019, J Exp. Med; Martinez-Riano, A. et al 2023. Commun. Biol.; Borroto A, et al., 2016, Sci Transl Med; Cruz-Adalia A, et al., 2017, Nat Commun; Merino-Cortes SV, et al., 2020, Sci Signal.; Patent application number PCT/EP2019/080990). Moreover, during my PhD I disseminated my results by participating in 8 conferences, obtaining two scholarships, and being selected for 4 oral presentations. Throughout my PhD I also supervised two students in the lab, one of them during his MSc dissertation.

After graduating my PhD with Cum Laude, in 2018 I moved to the laboratory of Prof. Pavel Tolar (The Francis Crick Institute / University College of London). There, by using microscopy of clarified organs, single-cell transcriptomics, and FDC-targeting genetics, I described the antigen dynamics within the B cell follicles during the germinal center response, which led to a first-author publication (Martinez-Riano, A. et al., 2023. Nat. Immunol). Moreover, I also collaborated in other projects (Malinova, D. et al 2021. EMBO Reports). In 2023, I moved to the laboratory of Prof. Ignacio Melero (Centro de Investigación Médica Aplicada, Pamplona), where, as a senior postdoc, I am investigating new immunomodulatory therapies to enhance the immune anti-tumoral response. In this brief period of time, I have participated in writing a review about the relevance of cytotoxicity during the anti-tumoral immune response (Luri-Rey, C. et al. 2023. Immunol. Rev). Importantly, throughout these years as a postdoctoral researcher, I have further developed my scientific and leadership skills by building up the knowledge, the tools, and a new network of collaborations. Moreover, I have also contributed to mentoring students in the laboratory and teaching undergraduate students at the university, which has allowed me to obtain the title of Associate Fellow of the Higher Education Academy of UK. The dissemination of my work to the scientific community and to a broader audience has been accomplish by attending conferences and participating in public engagement campaigns. Moreover, I have reviewed an article and been part of a Thesis Committee Board in 2021. Overall, my experience shows my ability to succeed as an independent researcher.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | TORRES NUÑEZ, SANDRA |
| **Referencia:** | RYC2023-042649-I |
| **Correo Electrónico:** | sandra88tn@gmail.com |
| **Título:** | Role of inflammasome and mitochondria interplay: impact on the pathogenesis of hepatocellular carcinoma (HCC) and hepatotoxicity |

**Resumen de la Memoria:**

My research efforts over the years have concentrated in finding new therapeutic targets for the treatment of liver and lysosomal diseases. During my PhD I developed a new research line investigating the impact of mitochondrial cholesterol in hepatic and lysosomal disorders. I described for the first time that the mitochondrial antioxidant capacity is a crucial event in the lysosomal disorder NPC, improving motor dysfunction and extending life span in a genetic mice model of NPC. My stay at the laboratory of Prof. Neil Kaplowitz, a world leading expert in DILI, encourage me to further investigate the molecular and cellular mechanisms underlying DILI, focusing on the impact of mitochondrial cholesterol loading and role of STARD1, a mitochondrial outer membrane protein that transports cholesterol to the mitochondrial inner membrane. During my three years as postdoc in IDIBAPS, I led three independent projects, which generated several publications in high-impact journals as first author. For example, I was first author of a seminal paper in which we generated for the first time Stard1f/f mice as a crucial tool to delete STARD1 is cell specific populations, such as hepatocytes (Stard1 ΔHep), that was key to demonstrate the role of STARD1 in acetaminophen induced hepatotoxicity. My third article as first author demonstrates the STARD1 upregulation in Niemann Pick type C disease occurs by an ER stress‐independent mechanism involving ACDase‐mediated STARD1 repression. My passion about translational research led me to the University of Frankfurt in 2019 to work with Prof. Trebicka, a clinician scientist and world leading expert in the study of inflammasome in liver cirrhosis, where I leaded two European projects to find new therapeutic candidates to reduce liver fibrosis.

In 2022, I was awarded with a Beatriu de Pinós grant, which allows me to work as an independent investigator, leading a new research line to explore the modulation of cellular and molecular pathways involved in the pathogenesis of HCC with a special emphasis in the role of inflammasome and mitochondria in the progression of disease. Previous data suggested that accumulation of cholesterol in mitochondria contributes to mitochondria dysfunction, ROS generation, endoplasmic reticulum stress, inflammation, and cell death leading to MASH and its progression to HCC. Interestingly, the NLRP3 inflammasome, an intracellular multiprotein complex activated upon cellular stress by danger signals, could be positively regulated by ROS derived from cholesterol-mediated mitochondrial dysfunction, indicating an association between mitochondrial cholesterol overload and inflammatory diseases. The principal objectives of my future research as independent researcher include: 1) Uncover detailed molecular mechanisms of the role of mitochondrial cholesterol/inflammasome axis in the pathophysiology of the NASH progression to HCC. 2) Identify new therapeutical targets in HCC, with the aim to unmask new players mediating the recruitment/activation of the inflammasome by cholesterol-mediated mitochondrial dysfunction and impact in metabolic reprogramming. 3) Characterize preclinical models of translational relevance using mice with humanized livers, as well as the use of patient-derived xenographts from patients with HCC and 3D culture combined with state-of-the-art technologies.

**Resumen del Currículum Vitae:**

I performed my PhD in the laboratory of Prof. Dr García Ruiz at the Institute of Biomedical Research in Barcelona (IIBB) belonging to the Spanish Nacional Scientific Council (CSIC), thanks to a predoctoral fellowship and a short-term international scholarship from the Spanish Ministry of Science and Education. My PhD doctoral thesis (2013-2016), focused on the contribution of sphingolipids and cholesterol in drug-induced liver injury (DILI) and in Niemann Pick type C disease. During my PhD, I performed an international stay at the Laboratory of one of the internationally recognized leaders in DILI, Prof. Neil Kaplowitz at the University of Southern California. This stay gave me the opportunity to deepen my understanding on the role of mitochondrial cholesterol in acetaminophen liver-injury. In 2016, I defended my PhD thesis at the University of Barcelona, obtaining the maximum qualification of Cum Laude with International Mention. The scientific output of my PhD accounts for 5 publications (1 as first author, Redox Biol. 2016), all of them in Q1 with an average IF of 7.1.

After my PhD defense, I worked as a postdoctoral researcher at the Institute August Pi I Sunyer (IDIBAPS) during 3 years, where I completed my work on DILI, based on the effect of valproic acid and acetaminophen. My work demonstrated for the first time the interplay between endoplasmic reticulum stress and the mitochondrial cholesterol transporter STARD1, receiving two awards at international meetings. In summary, during this first postdoctoral fellowship, I published 9 papers including 3 reviews, 2 as first author (Gastroenterology 2019 and Redox Biol 2021), and filed a patent. The average IF of my peer-reviewed papers (all Q1) was of 11.1. In 2019, I was offered with a postdoctoral position at the laboratory of Prof. Jonel Trebicka at the University Clinic Frankfurt in Germany. During this period and in collaboration with Industry, I lead two projects, aimed to select the best candidate to reduce fibrosis in different experimental models of liver fibrosis in vivo and in vitro. This work was awarded at the AASLD liver meeting and published in Hepatology 2021. During these 2 years as a postdoc, I have been working with external partners from the H2020 and published a total of 10 peer-reviewed articles (all Q1) in the field of liver fibrosis with an average IF of 7.3.

In 2022, I joined the Department of Cell Death and Proliferation at the IIBB-CSIC thanks to being awarded a competitive Postdoctoral Contract Beatriu de Pinós 2021, which allows me to have my own projects as PI, financed by MINECO (PID2022-140169OB-C22), ISCIII (Intramural CIBER Project 2023) and AGAUR (BP2021-AGAUR), to pursuit my scientific career in the inflammasome-mitochondria interplay in hepatocellular carcinoma field. Since then, I have published 7 papers. In summary, during my scientific career, I have participated in 18 research projects (IP in 3), presented my work in 37 scientific meetings, and co-authored 33 publications (8 D1), being the first author of 10 of them (4 D1) and 1 as corresponding author, which accumulate over 784 citations. I have favored international collaborations, performed outreach activities, trained and supervised students of different levels and earned several research awards.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | JUAN DE SOLIS, ALAIN |
| **Referencia:** | RYC2023-045638-I |
| **Correo Electrónico:** | desolisaj@gmail.com |
| **Título:** | Role of hypotalamic neurocircuits in the regulation of metabolism. |

**Resumen de la Memoria:**

My scientific career has investigated the neuronal control of physiological processes that control energy balance and how their deregulation impacts human health and disease. My extensive research experience started at the Centro de Biología Molecular Severo Ochoa and included two postdoctoral positions at international research institutions in USA and Germany. This scientific trajectory has allowed me to acquire comprehensive scientific knowledge and expertise related to the neuronal control of metabolism. Now, I will develop my own independent research line at the Universidad Rey Juan Carlos through the Atracción de Talento "Cesar Nombela" program.

I will investigate the development and metabolic functions of novel hypothalamic neurocircuits that connect with the hindbrain in the regulation of energy homeostasis. Hypothalamic neurocircuits regulate energy homeostasis by coordinating the response of metabolic organs. Metabolic insults, such as HFD, compromise the correct regulation of energy homeostasis, promoting the development of obesity, diabetes, and metabolic diseases. Altered nutritional levels during the gestation and postnatal periods impact the development of hypothalamic neurocircuits that result in maladaptive maturation and early weight gain, which is a hallmark of developing obesity, diabetes, and metabolic diseases in early adulthood in rodents and humans. However, the temporal development of the neurocircuits that connect the hypothalamus with hindbrain areas is not fully described yet.

I will use a multidisciplinary approach, employing transgenic mouse lines, neuroscience techniques, adenoviral injection, and metabolic phenotyping (energy expenditure, insulin, and glucose homeostasis). Additionally, I will introduce developmental programming interventions (high-fat diet during lactation) and single-cell sequencing protocols to unravel gene networks affected by postnatal nutritional status during the development of hypothalamic metabolic neurocircuits. Finally, experiments will be performed on male and female mice, and results will be reported independently to reveal sex-specific differences. For this project, I present the following initial objectives:
1. Characterize the development of critical PVH neurocircuits and their susceptibility to programming developmental events.
2. Delineating the metabolic role of Npy1RPVH neurocircuits and the impact of HFD in their development.
3. Unravel the role of astrocytes and oligodendrocytes in the maturation of PVH neurocircuits.

I possess the technical expertise, resilience, and critical thinking required to develop these objectives successfully. In addition, working in international laboratories has allowed me to develop highly interpersonal skills and create a solid international network. Results obtained from this project will be published in peer-review open-access journals and presented at scientific conferences to receive feedback from the scientific community. The impact of these investigations will expand our knowledge and reveal novel metabolic neurocircuits, understanding how their deregulation promotes obesity, diabetes, or other metabolic diseases. These results will contribute to identifying new possible druggable targets involved in metabolism regulation and improve therapies and better public health strategies to reduce childhood obesity.

**Resumen del Currículum Vitae:**

My scientific career has focused on the regulation of metabolism and energy homeostasis by hypothalamic neurons. To pursue this aim, I have worked in leading international laboratories in world-known research institutions.

During my Ph.D. studies at the Centro Biología Molecular Severo Ochoa, I found that age-related increase in leptin levels impairs insulin signaling in the skeletal muscle and promotes higher blood glucose levels in Wistar rats (De Solis AJ. Mol Mech Dis 2012). Following my interest in hypothalamic neurocircuits, I got a postdoctoral position at Dr. L. Zeltser's laboratory at Columbia University of New York. My research project explored how altered nutritional states during postnatal development impacted the maturation of AgRP neurocircuits. Those investigations led to 2 impactful publications (Baquero A. J Neurosci 2014; De Solis AJ. Mol Metab 2016). During this period, I created my own international scientific network that resulted in two fruitful collaborations (Farino CJ. Mol Psychiatry 2019, and Wang L. JCI Insights 2019).
In 2016, I secured a postdoctoral position at Max Planck Institute for Metabolism Research in Cologne to widen my expertise in hypothalamic circuits and their role in glucose homeostasis. There, I was awarded a Marie Curie Individual Fellowship in 2017. In this project, I unraveled how the interplay between two key antagonic hypothalamic neurocircuits differentially regulates food intake and systemic metabolism through the modulation of the Sympathetic Nervous System. These extensive experimental results were published in Nature Metabolism journal (De Solis AJ. Nat Metabol 2024).
During this period, I also collaborated on other projects applying my scientific knowledge and technical expertise (Engström-Ruud L. Nature Comm 2020; Steurnagel L. Nature Metab 2022; and Ganziano I JCI Insights 2020) and attended selected training courses to strengthen my leadership skills (EMBO Laboratory Leadership 2018). From this period, I expanded my network including several young group leaders in Germany, Sweden, and Denmark. I have been invited to present my scientific data at Keystone symposia (2015), awarded with a travel fellowship and at a special Marie Curie Fellows meeting (2019), among others. Moreover, I participated as an expert in the revision panel for MSCA fellowships (2019) and in 3 thesis committees in Spain (2019-2021). I collaborated with Dr. C. Pintado (UCLM) in an Erasmus+ program to supervise 3 graduate students. Finally, I participated in outreach activities at the Max Planck Day (2017-18) and in public dissemination seminars organized together with CERFA (Society of Spanish Scientists in Germany).
Since March of 2024, I will commence my own independent research laboratory through the program Atraccion de Talento "Cesar Nombela" at the Universidad Rey Juan Carlos (URJC). I aim to expand my research interests by identifying novel hypothalamic neuronal circuits that connect with hindbrain structures and their role in the regulation of energy homeostasis. I am confident to lead a research group successfully thanks to the scientific

knowledge, skills, and leadership competencies acquired during my international scientific career. This research will contribute to understand how the deregulation of hypothalamic neurocircuits promotes obesity, diabetes, and other metabolic diseases.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | MARTINEZ MURIANA, ANNA |
| **Referencia:** | RYC2023-045676-I |
| **Correo Electrónico:** | anna.martinezmu@gmail.com |
| **Título:** | Human microglia response in neurodegeneration |

**Resumen de la Memoria:**

During my doctoral studies, I deeply characterized the microglial responses in the central nervous system and uncovered therapeutic targets in Amyotrophic Lateral Sclerosis (ALS) mouse models. Directly from the hands-on expertise and intellectual contribution to those works, I learned key aspects of the pathophysiology involved in ALS, functional assays to evaluate the progression of the disease and developed expertise on microglial biology. During my postdoctoral training, I broad my horizons by developing a new human-microglia xenotransplantation model to study human microglia function in vivo and applied it to study Alzheimer's disease (AD). Now that I am initiating my career as independent group leader, I would like to circle back and apply my expertise in humanized systems to study the role of microglia in ALS.

ALS is a fatal neurodegenerative disease characterized by the progressive degeneration of upper and lower motoneurons. Last genetic studies revealed that the majority of ALS cases were caused by mutations in the C9orf72 gene, a gene highly enriched in microglia. C9orf72 mutations in microglia showed an aberrant activation of these cells that led to cell death when co-cultured motoneurons. Hereby, these recent insights suggests that ALS genetic risk affects microglia function, drawing a direct link between human ALS genetics and microglia as drivers of neurodegeneration. However, how mutations in the C9orf72 gene impact human microglia function and lead to degeneration remain unknown. In this project, I want to decipher how human microglia harboring ALS mutations drives disease pathogenesis. Here, I hypothesize that mutations in the C9orf72 gene lead to dysfunctional microglia, worsening ALS disease progression. The main objective of my research will be to unravel the molecular mechanisms by which the C9orf72 leads to an impaired human microglial response and how they contribute to the disease. To explore this hypothesis, I will use my cutting-edge microglial xenotransplantation model to 1) correlate the phenotypic changes with functional assays, 2) study the impact of C9orf72 mutations on human microglia transcriptomic and proteomic profiles, and 3) uncover new therapeutic targets to modulate these aberrant phenotypes. Overall, this experimental design will allow me to scrutinize how ALS mutations affects the function of human microglia in vivo.

**Resumen del Currículum Vitae:**

I started my scientific career more than decade ago as a bachelor's intern at the Universitat Autonoma de Barcelona. In 2013-2014, I completed my master's thesis under the supervision of Prof. Ruben Lopez-Vales, who offered me a PhD position to pursue my doctoral studies that I completed in July 2018. The main objective of my PhD was to uncover the role of the neuroinflammatory response in Amyotrophic Lateral Sclerosis (ALS), a fatal neurodegenerative disease. From these studies, I acquired a strong knowledge on microglia biology and neurological disorders as ALS, multiple sclerosis or traumatic injuries to the central nervous system. Resulting from those studies, I co-authored multiple publications including 4 first/co-first, 6 co-authors and 1 patent filed on January 2017. The strong expertise on microglia biology brought me to next chapter of my scientific career, a postdoc at the laboratory of Prof. Bart De Strooper (VIB, Belgium), who was starting a new line of research to untangle the role of microglia in AD. During my postdoctoral stage at VIB, I learnt how to conceptualize, design and write high competitive grants. As results, I was awarded with some of the most prestigious fellowships to elaborate my research: the Marie Curie Seal of Excellence – FWO fellowship and the Alzheimer's Association Research Fellowship. With these grants, I did not only conducted my research, but also learnt how to apply, manage and report for highly competitive grants. From a research point of view, I deepened my knowledge on microglia biology and pioneered a human microglia xenotransplantation model to study the role of human microglia in physiology and disease (Fattorelli N and Martinez-Muriana A et al., 2021, Nature Protocols). This model was a breakthrough in the field since allowed us to study the role of human microglia in an unprecedented way. For instance, we uncovered how human microglia contributes to Alzheimer's disease in vivo (Mancuso R, Fattorelli N and Martinez-Muriana A et al., accepted in principle in Nature Neuroscience, available as pre-print in BioRxiv: 10.1101/2022.07.07.499139). During these years, I also had the chance to collaborate with top-notch scientist, allowing me to contribute to important research articles deciphering microglial signaling pathways (Hou P et al., 2023 Molecular Cell) or their role shaping adaptive immunity (Pasciuto E et al., 2020, Cell). Besides this postdoctoral output, I am currently finalizing my main project from which I expect to publish 2 more first-author papers soon and another co-authorship currently under review (Lloyd A et al., as pre-print in BioRxiv - https://doi.org/10.1101/2022.07.07.498804). I am confident I have acquired critical scientific, analytical, leadership and organizational skills during these years at VIB and under the mentorship of Prof. Bart De Strooper, which have immensely boosted my scientific career. This international postdoctoral experience has granted me with an invaluable network of internationally renowned scientist from whom I would greatly benefit during the next stage of my career. All this experience provided me with a strong basis from which I can further develop my own research, and significantly contribute to my field as an independent researcher.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | CANALES RODRÍGUEZ, ERICK J. |
| **Referencia:** | RYC2023-042763-I |
| **Correo Electrónico:** | ejcanalesr@gmail.com |
| **Título:** | Advancing in vivo brain tissue microstructure imaging through multimodal MRI: theory, validation, and clinical applications |

**Resumen de la Memoria:**

I am an experienced researcher with a robust publication record and international exposure. The Magnetic Resonance Imaging (MRI) techniques I develop, tailored for medical applications, aim to enhance the understanding, early detection, and monitoring of neurological conditions. Notably, I won several international challenges in MRI, showcasing the efficacy of my work. My interdisciplinary research agenda is well-aligned with the health system's priorities.

The key indicators of my scientific production encompass 95 journal papers (93.9% in Q1 journals; mean impact factor of 6.7) and two book chapters. I have served as the first, last, or corresponding author for 24 papers, presented 65+ conference papers and abstracts, accumulated 7150 citations, and achieved a personal h-index of 38 and h-10 of 70 (Google Scholar). Moreover, I have co-developed ten software tools.

My academic journey includes a Bachelor's degree in Physics from the University of Havana (Cuba), a Master's degree from the Faculty of Medicine at the University of Barcelona (Spain), and a PhD from the University of the Basque Country (Spain). My professional trajectory has taken me across multiple countries, including Cuba, Spain, Italy, Denmark, the UK, and Switzerland, where I currently serve as a Senior Researcher at the Swiss Federal Institute of Technology in Lausanne (EPFL).

I have actively contributed to 15 research projects, securing a total funding of €1.3 million. As the principal investigator in 4 projects (totalling €800,000), I demonstrated versatility and leadership. Since 2020, I have led my own independent research project, generously supported by the prestigious Ambizione grant from the Swiss National Science Foundation (600,000€). I have supervised over 15 students across Bachelor's semester projects, Master's, and PhD theses. Additionally, I have co-organised various international workshops.

My contributions have been acknowledged through various awards, underscoring the broader impact of my research. Significant awards comprise recognition by the Cuban Academy of Sciences (2007, 2011), the Spanish Neuroimaging Society (2010), the Catalan Society of Psychiatry and Mental Health (2016), and the Academy of Medical Sciences and Health of Catalonia and the Balearic Islands (2016). The methods I developed also won in various international diffusion MRI reconstruction challenges, organised at prominent conferences such as the IEEE International Symposium on Biomedical Imaging (2012, 2013, 2018) and the International Conference on Medical Image Computing and Computer-Assisted Intervention (2019).

Securing a Ramón y Cajal (RyC) position presents an invaluable opportunity to establish my research group in Spain. I aim to advance my research program, focusing on novel multi-modal MRI techniques to estimate axon diameters on clinical scanners to enhance translational research, developing advanced quantitative MRI techniques in low-field scanners to improve accessibility in economically constrained regions and pioneering innovative microstructure MRI validation approaches by developing brain organoids generated from induced pluripotent stem cells to minimise the use of sacrificed rodents. During the RyC fellowship, I plan to apply for the "Consolidator ERC" grant to secure additional funding for my ambitious research agenda.

**Resumen del Currículum Vitae:**

CURRENT POSITION
2020-present: Senior Researcher and Group Leader, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

PROFESSIONAL EXPERIENCE
2023: Visiting Scientist, Cardiff University Brain Research Imaging Centre (CUBRIC), UK
2022: Visiting Scientist, Danish Research Centre for Magnetic Resonance (DRCMR) & Technical University of Denmark (DTU), Copenhagen, Denmark
2019 – 2020: Postdoctoral Researcher (Sara Borrell program), FIDMAG Research Foundation, Barcelona, Spain
2017 – 2018: 1er Assistant Universitaire (Postdoc), Radiology Department, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland
2018: Guest Researcher, Computer Science Department, Verona University, Italy
2008 – 2016: Researcher, FIDMAG Research Foundation & National Mental Health Research Network (CIBERSAM), Barcelona, Spain
2004 - 2007: Junior Researcher, Cuban Neuroscience Center, Havana, Cuba

EDUCATION
2003: Bachelor's degree in Physics, University of Havana, Cuba
2006: Postgraduate courses (MSc), Cuban Neuroscience Center, Havana, Cuba
2014: MSc, Faculty of Medicine, University of Barcelona, Spain
2016: PhD (Summa cum laude), Faculty of Informatics, University of the Basque Country, Spain

GRANTS
I have actively participated in 15 research grants
As PI or main applicant:

2020-2024: Ambizione Grant (Swiss National Science Foundation, 600,000€)
2019-2020: Sara Borrell – Grant salary (Instituto de Salud Carlos III, Spain, 80,598€)
2016-2018: Research Grant (Instituto de Salud Carlos III, Spain, 99,220 €)
2018: Pilot project Grant (University of Verona, Italy, 6,000€)
2010-2011: National Health Research Network Grant (CIBERSAM, 30,000 €)

AWARDS
2021: Frontiers in Neuroinformatics Editor's Pick
2019: First Place, "IronTrack Challenge 2019", MICCAI Conference, China
2018: First Place: Macaque Validation Challenge at the "3-D Validation of Tractography with Experimental MRI", IEEE ISBI, USA
2016: "Vila Saborit" Prize of the Catalan Society of Psychiatry and Mental Health, Spain
2016: "Josep Trueta" Research Award of the Academy of Medical Sciences and Health of Catalonia and the Balearic Islands: FIDMAG Research Foundation team, Spain
2013: Co-winner of the High Angular Resolution Diffusion Imaging Reconstruction Challenge 2013, IEEE ISBI, USA
2012: Co-winner of the High Angular Resolution Diffusion Imaging Reconstruction Challenge 2012, IEEE ISBI, Spain
2011: Award of the Cuban Academy of Sciences, Cuba
2010: NeuroImageN Prize for the most outstanding Spanish neuroimaging study by "Sociedad Española de Neuroimagen", Spain
2007: Award of the Cuban Academy of Sciences 2007, Cuba

PUBLICATIONS
- 95 journal papers and two book chapters (24 as the first, corresponding, or last author)
- Articles in Q1 journals: >90%, mean impact factor: 6.7
- 65+ abstracts, posters & talks
- Citations: 7150+, h-index: 38, h-10: 70 (Google Scholar)
- Software tools with documented use: 10

INTERNATIONALISATION
- 9 years of research experience at international top-ranked universities and centres
- International network of world-class collaborators (EPFL, CUBRIC, DRCMR, DTU, University of Verona, INRIA, Siemens, CHUV, etc.)
- Organised international workshops

INDEPENDENCE AND LEADERSHIP
- Running own group/project since 2020
- Raised 1.3 million €, 800,000 € as the PI
- I have supervised 15 students across Bachelor's semester projects, Master's, and PhD theses

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | QUIROGA VARELA, ANA |
| **Referencia:** | RYC2023-045019-I |
| **Correo Electrónico:** | aquiroga@idibgi.org |
| **Título:** | Synaptic hallmarks and cognitive biomarkers in neurodegeneration: Connecting Molecular Insights to Clinical Applications |

**Resumen de la Memoria:**

Throughout my research journey, I've been dedicated to advancing our understanding of neurodegeneration, primarily focusing on Parkinson's Disease (PD) and, in recent years, Multiple Sclerosis (MS). Currently, I am delving into the intricate exploration of synaptic alterations as a basis for early cognitive changes in the neurodegenerative process. My academic journey, starting with a BSc in Biochemistry and an MSc in Biomedicine, laid the groundwork for this scientific pursuit. Following my initiation into the scientific realm in 2008 at Prof. Obeso's lab at CIMA-Universidad de Navarra, I earned my Ph.D. in Neuroscience and Cognition in 2013. Post-Ph.D., my specialization in synaptic physiology and plasticity at the Università Degli Studi di Perugia, Italy, marked a pivotal turning point in my career. Returning to Spain in 2015, I took up leadership roles in translational PD research at Bioguipuzkoa HRI and CIMA-Universidad de Navarra. In this context, my research solidified its focus on synaptic alterations as a fundamental underpinning for early neurodegenerative changes, shaping the onset of both motor and cognitive signs in parkinsonism. Recent senior contributions (Brain 2022; Brain 2023) underscore the significance of these foundational efforts, forming the basis for my current research line, anchored in synaptic dysfunction as a fundamental precursor to cognitive decline in neurodegenerative diseases (NDs). Expanding my investigative scope to Multiple Sclerosis (MS), an underexplored yet impactful neurodegenerative condition, my research aims to delineate the distinctions between early and late neurodegeneration, crafting a unique signature in cognitive impairment (CI) across the progession of the disease. My ongoing project, as Principal Investigator (PI), aims to diagnose cognitive progression in MS using early circulant biomarkers, emphasizing the indispensable role of synaptic alterations in early cognitive dysfunction. The overarching goal is to identify blood-based synaptic biomarkers for early cognitive dysfunction detection, revolutionizing neurology practices and improving the quality of life for MS patients. Aspiring to contribute significantly to personalized medicine, my research provides essential measures for diagnosis, monitoring, and personalized disease progression, reducing the overall impact of NDs on healthcare, social, and workplace costs. Beyond the laboratory, my commitment extends to fostering inclusivity, empowering women in research, and catalyzing positive change in the academic landscape. Through mentorship and a multidisciplinary approach, I aim to bridge gaps and promote the principles of open science globally, fostering diversity, collaboration, and transparency.

**Resumen del Currículum Vitae:**

I am a neuroscientist with a strong background in biochemistry and biomedicine, having earned a BSc in Biochemistry (2007) and an MSc in Biomedicine (2008) from UAB and UB in Spain, respectively. My scientific journey began in 2008 at Prof. Obeso's lab at CIMA-Universidad de Navarra, where I extensively studied a rat parkinsonism model, contributing to our understanding of basal ganglia dynamics. Further enriching my expertise, I conducted electrophysiological recordings at the National Institutes of Health (NIH) and earned a Ph.D. in Neuroscience and Cognition in 2013 with international recognition. Under the guidance of Prof. Calabresi at Università Degli Studi di Perugia, Italy, my Ph.D. research focused on corticostriatal synaptic plasticity in rodent models, exploring neurotransmission alterations in motor and cognitive disorders. Specializing in Whole-Cell Patch-Clamp recordings, I played a key role in result interpretation, authored 7 original manuscripts, and developed skills in coordinating research projects within my team. Upon returning to Spain in 2015, I assumed a leadership role in translational PD research, shaping basic research strategy and securing funding until 2021 at Bioguipuzkoa HRI (2015-2018) and subsequently at CIMA-Universidad de Navarra (2018-2021). Notably, my focus on synaptic functionality in the premotor stages of PD led to significant publications, challenging conventional views and offering promising avenues for targeted therapies. Building on this success, I expanded my research to identify cognitive biomarkers in MS, joining IDIBGI's Neurodegeneration team in 2021. Currently overseeing the basic research strategy and coordinating PhD students (3 theses supervised and 3 ongoings), my ongoing research emphasizes biomarker discovery using biofluids and postmortem tissue. As the Principal Investigator of a project recently funded by the ISCIII (2023), I lead efforts to diagnose cognitive progression in MS using early circulant biomarkers. My publication metrics include 25 articles, 2 book chapters, and an H-index of 15, with 1777 citations. Notably, 46% of my articles are published in D1 category journals, reflecting widespread dissemination and a positive community evaluation. As a mentor, I've successfully supervised numerous students and overseen the completion of Ph.D. and MSc theses, showcasing my natural leadership abilities. Additionally, I actively contribute to the scientific community as a reviewer for international journals, evaluator of projects for the EU Commission, and a member of various research networks. My commitment to effective science communication is evident in outreach activities, conferences, and webinars to patients and social organizations. Professionally, I have a complete training background in ethical, legal, and managerial aspects crucial for successful research conduct and project leadership. I am dedicated to fostering a vibrant scientific community and advancing our understanding of neurodegenerative diseases.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | GARCIA CAÑAVERAS, JUAN CARLOS |
| **Referencia:** | RYC2023-045207-I |
| **Correo Electrónico:** | juancarlos_garcia@iislafe.es |
| **Título:** | Estudio del metabolismo celular mediante el uso de trazadores isotópicos y metabolómica basada en LC-MS |

**Resumen de la Memoria:**

Mi trayectoria se ha centrado por un lado en el desarrollo herramientas analíticas (basadas en LC-MS/MS) y bioinformáticas para el estudio del metaboloma y el lipidoma y por otro lado en el uso de trazadores isotópicos estables para el estudio del metabolismo en cáncer y en inmunología.

A nivel metodológico, mis contribuciones más relevantes son el desarrollo de LipidMS, un software para el análisis de datos lipidómicos, y el desarrollo de un marco experimental para el estudio del metabolismo de ácidos grasos (AG) mediante el uso de trazadores isotópicos plasmado en FAMetA, un software para el análisis del metabolismo de ácidos grasos. A nivel biológico he contribuido a la identificación de vulnerabilidades metabólicas/procesos clave en el contexto del cáncer (leucemia linfoblástica aguda de células T) y de la respuesta inmunitaria (proliferación, diferenciación y función efectora de células T).

Los ácidos grasos (AG) son componentes clave de las membranas celulares, pero también precursores de moléculas de señalización y fuentes de energía. Pueden sintetizarse de novo en el interior de las células o importarse de fuentes externas. El principal producto de la lipogénesis de novo (DNL) es el ácido palmítico [AG(16:0)], mientras que los AG esenciales (ácido linoleico [AG(18:2n6)] y el ácido g-linolénico [AG(18:3n3)]) deben adquirirse de forma exógena. El conjunto de AG presentes en las células resulta de las biotransformaciones (elongación, desaturación y degradación) que se producen en su interior. Sin embargo, la red metabólica de los AG esta pobremente definida.

El objetivo principal es dilucidar con precisión las funciones específicas de cada proteína, enzima o transportador, implicados en los procesos de importación, DNL, elongación, desaturación y degradación en todo el espectro de los AG. Las alteraciones en el metabolismo de AG son habituales en cáncer y sustentan el crecimiento y la supervivencia del tumor. Muchas proteínas dentro de la red metabolica de los AG poseen potencial como dianas terapéuticas en cáncer. Es por ello que planteamos realizar el esudio en cuatro líneas celulares con relevancia clínica en humanos (A549, adenocarcinoma de pulmón; Huh7, hepatocarinoma; T3M4, adenocarcinoma pancreático; y Jurkat, leucemia linfoblastica aguda de células T).

El principal enfoque experimental consiste en emplear CRISPR/Cas9 para la deleción genética de cada gen diana. Posteriormente, se evaluarán funcionalmente las consecuencias metabólicas. La evaluación detallada de las alteraciones inducidas en el metabolismo de los AG se realizará mediante la combinación de la incubación con trazadores de isótopos estables, el análisis basado en la lipidómica por LC-MS, y el análisis e interpretación de los datos con versiones mejoradas de dos programas informáticos propios (13C-LipidMS y FAMetA). Evaluaremos si los genes eliminados afectan a la proliferación y supervivencia celular, ya sea en condiciones de cultivo estándar o bajo la influencia de factores de estrés adicionales (es decir, privación externa de lípidos, supresión simultánea de proteínas adicionales...). Además, pretendemos identificar, mediante la combinación de aproximaciones in silico y la evaluación en modelos celulares con la metodología desarrollada durante el proyecto, inhibidores con actividad celular para cada una de las proteínas implicadas en el metabolismo de AG.

**Resumen del Currículum Vitae:**

Me doctoré en Bioquímica y Biomedicina (Universitat de València, 2015) ("Programa VALi+d para investigadores en formación", Generalitat Valenciana). Continué mi formación posdoctoral en el laboratorio del Prof. Joshua D. Rabinowitz (Princeton University, NJ, EE.UU.) y en el laboratorio del Dr. Agustín Lahoz (IIS-La Fe, España) (MSCA-IF-GF, 2017-2020). En 2020 me incorporé a la Unidad de Unidad de Biomarcadores y Medicina de Precisión (UBMP, IIS-La Fe) como investigador postdoctoral (Pla GenT, Generació Talent, Generalitat Valenciana).

He recibido una amplia formación en citometría de flujo, cultivo celular incluyendo aislamiento y cultivo de células T primarias humanas y de ratón, metabolómica y lipidómica basada en cromatografía de líquidos acoplada a espectrometría de masas (LC-MS), bioinformática y en el uso de trazadores isotópicos estables para el estudio del metabolismo.

Soy primer autor/autor de correspondencia de 7 artículos técnicos (desarrollo de métodos de análisis metabolómico/lipidómico y herramientas bioinformáticas) y 3 trabajos aplicando los métodos desarrollados en el contexto del cáncer y el metabolismo de las células inmunes, además de contribuir con las herramientas desarrolladas en 12 publicaciones en múltiples contextos.

A nivel metodológico, mis contribuciones más relevantes son el desarrollo de LipidMS, un software para el análisis de datos lipidómicos obtenidos por LC-MS (Alcoriza-Balaguer y García-Cañaveras et al, Anal Chem 2019; Alcoriza-Balaguer et al. Bioinformatics 2022) y FAMetA ,un software para el análisis del metabolismo de ácidos grasos basado en la distribución de isotopólogos generada tras incubación con trazadores isotópicos y análisis por LC-MS (Alcoriza-Balaguer y García-Cañaveras et al, Brief. Bioinform. 2023). Los hallazgos más relevantes de mi investigación se refieren a la identificación mediante metabolómica basada en LC-MS, de enzimas metabólicas clave en diversos entornos. En la leucemia linfoblástica aguda de células T (T-ALL), identificamos que la enzima SHMT permite la proliferación mediante la síntesis de novo de purinas. de novo de purinas y desarrollamos un inhibidor eficaz in vitro e in vivo (García-Cañaveras y Lancho et al, Leukemia 2020). En linfocitos T efectores, identificamos que la actividad de la enzima G6PD es necesaria para la función efectora y desarrollamos el primer inhibidor de la G6PD celularmente activo (Ghergurovich y García-Cañaveras et al, Nat. Chem. Biol. 2020). He sido el IP de 3 proyectos basados en el uso de la metabolómica basada en LC-MS para estudiar el papel del metabolismo inmune en la respuesta antitumoral en el contexto del cáncer de pulmón y actualmente soy responsable del análisis de las muestras generadas dentro del proyecto SMARTER: Smart MAnufactuRing for Autologous Cell ThERapies enabled by innovative biomonitoring technologies and advanced process control financiado por la Comisión Europea (HE EIC Pathfinder Challenges). Colaboro con: Dra. Sonia Águila (Instituto Murciano de Investigación Biosanitaria Virgen de Arrixaca), Dr. Raphael Morscher (Hospital Infantil Universitario de Zúrich), el Dr. José Antonio Encinar (IDiBe Elche) y el Dr. Isidro Sánchez Garcia (Universidad de Salamanca).

Soy director de tesis de Guillermo Suay Montagud (Programa de Doctorado en Medicina, UV) y Andrea Armero Mateu (Programa de Doctorado en Biotecnología, UPV).

**Área Temática:** **Biomedicina**
**Nombre:** FERRER AGUILAR, GERARDO
**Referencia:** RYC2023-043903-I
**Correo Electrónico:** ferrer.gerardo@gmail.com
**Título:** Cellular and molecular immunological drivers of leukemia

## Resumen de la Memoria:

My undergraduate degree in biotechnology provided a broad understanding of how contemporary technology can be used to unravel biological conundrums, with a focus on human physiology. I participated in two summer internships of three months each, one in the Institut d' Investigacions Biomèdiques de Barcelona (Spain) using molecular biology techniques to understand hemostasis, and one in the Virginia Polytechnic Institute and State University (USA) working with mice models in inflammatory bowel diseases and obesity.

My PhD studies with Prof. Monserrat and Dr. Moreno at the University of Barcelona focused on autoimmunity and cancer biology, specifically related to chronic lymphocytic leukemia (CLL). For five years, I improved my skills throughout the entire research cycle. I presented my findings as posters and oral presentations at international meetings. Our work focused on autoimmune cytopenias in CLL and describing the relevance of microenvironment signals known as BAFF and APRIL in promoting the survival of leukemic cells by the induction of antiapoptotic genes as well as modulating surface proteins to increase the strength of secondary signals. All this impacting in the outcome of patients. Since our group was very small, I was physically located in another group working on the genetics of lung and colon cancer allowing me to synergize with them and perform several collaborations during and after my PhD, expanding my knowledge in cancer biology and epigenetics. For which I opened a new line of research on the epigenetics of autoimmune cytopenias in CLL:

In 2013, I started as a postdoctoral researcher in training at The Feinstein Institute for Medical Research (USA), working with Prof. Chiorazzi, one of the world leaders on a CLL xenograft model using immune-deficient mice; to understand better the interaction of CLL cells with other cells of the microenvironment, especially T cells. In addition, I started a new area of investigation on the interaction between myeloid suppressor cells and T cells in CLL patients and how therapy alters it, fragments of which have been selected for oral presentation in international meetings. In addition, throughout the last years, I was requested to peer-review from high-tier journals and an international meeting on CLL and immunology. I was also funded to support part of my research and involved in mentoring students that are now starting their own research path.

On December 2019 I joined Dr. Esteller' s lab (IJC, Badalona, Spain) founded by AGAUR (Beatriu de Pinós 2019-2021) EU Commission (MSCA-FI 2021-2023) and Fundación Científica AECC (INVES234765FERR). To develop my line of research linking leukemogenesis, immunology and epigenetics. In addition, I received funds as PI to study if epigenetic alterations are involved in developing MIS-C, an autoimmune complication in kids after COVID-19. As well as the agreement with Bristol Myer Squibb to evaluate a checkpoint inhibitor in our models and other national projects on epigenetics in inmuno/hemato oncology. I am also co-mentoring 2 PhDs and other students on immune-oncology and epigenetics.

My future plan is to consolidate a young faculty position, to start a program in leukemogenesis, immunology and epigenetics; with the mentoring of students to establish my own research group.

## Resumen del Currículum Vitae:

In 2003 I started a degree in Biotechnology at the University of Vic, until 2007. During the summers of 2005 and 2006, I did internships at the Institud d' Investigacions Biomèdiques de Barcelona and Virginia Polytechnic Institute and State University, respectively. For my contribution in the latter, I co-authored 2 papers (e.g. Guri AJ, J Nutr Biochem 2008)

In 2007 I joined Prof. Monserrat and Dr. Moreno' s lab and started the PhD program of Medicine at the UB. I defended my thesis in July 2012 with a cum laude grade. In this period, I published as the first and co-first (*) author 5 research papers (Moreno C*, Hodgson K*, Ferrer G* Blood 2010; Ferrer G Leuk Lymphoma 2011; Leuk Lymphoma 2013 and Br J Haemato 2014), 2 reviews (Ferrer G, Leuk Lymphoma 2009; Ferrer G, J of Immunol 2012; Hodson K*, Ferrer G* Haematologica 2011). In addition, I coauthor 7 research papers, 2 reviews and 1 book chapter (Including: Blood, Leukemia. Clin Transl Onco and Haematologica). These works were submitted to national and international meetings and my abstracts were selected for oral presentation twice and I also received one travel award from EHA. I was supported by competitive fellowships: IDIBAPS-FI (2008) and P-FIS (2008 – 2012).

In 2013 I moved to the USA to join the lab of Prof. Chiorazzi at the Feinstein Institute for Medical Research as a postdoc. I published 2 first or co-first author publications (Ferrer G Leukemia 2021; Patten PEM*, Ferrer G* Front Immunol 2021), 8 research papers as coauthor (Including: JCI, Leukemia and Haematologica), 1 review as first author (Ferrer G Molecular Medicine 2018), 1 invited commentary (Ferrer G EBioMedicine 2018) and 1 popular science article the latter two as the corresponding author. I did 4 oral presentations and received abstract awards (ASH 2015 and 2018, and the YIM-IW CLL in 2015 and 2017). I was funded by the Laura Strauss Foundation, participated in major funded grants (CLL-GRF and NIH) and contracts with pharmaceutical companies. I was requested to review the work of others from first-tier journals and I was part of the review board of the 21st EHA annual meeting. I mentored one undergraduate, a graduate and a master student.

In Dec 2019 I moved to the laboratory of Dr. Manel Esteller in Badalona with a Beatriu de Pinós Fellowship sponsored by the government of Catalunya. In 2020 I was awarded an H2020-MSCA-IF fellowship from the EU and in December 2023 I started as Investigador AECC. During this period, I co-first author two reviews (Rosselló-Tortella M*, Ferrer G* Blood Cancer Discov 2020, Ferrer G*, Álvarez-Errico D*, JNCI 2022) and coauthor three publications, produced two popular science publications and done several outreach activities, co-mentor two master student and two PhD students. I am member of the doctoral tracking commitie for the Biomedicine program of the University of Barcelona. I am now a reviewer for additional journals and the Argentinian, Polish and Ikerbasque funding programs. I also chaired a session in an EMBO Workshop and organized a meeting last September. Gave three lectures at the University of Barcelona. Finally, I have been awarded a grant from the Fundació de la Marató de TV3 to study a rare autoimmune syndrome in kids after COVID-19. I have an agreement with Bristol Myer Squibb as PI to evaluate a checkpoint inhibitor and I am leading WP in other national projects.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | JOSA CULLERÉ, LAIA |
| **Referencia:** | RYC2023-042477-I |
| **Correo Electrónico:** | laia.josacullere@gmail.com |
| **Título:** | Desarrollo de fármacos innovadores para eliminar las células madre tumorales con alta precisión |

**Resumen de la Memoria:**

I aim to lead an interdisciplinary research group that uses state-of-the art chemical biology to develop drugs that eradicate cancer stem cells (CSCs). Since the start of my research career, I have led projects that used synthetic chemistry to develop molecules with therapeutic or diagnostic applications. As a chemist by background with a clear aspiration to improve cancer treatment, I have sought opportunities to learn the necessary cancer biology techniques to lead impactful research at the interface of chemistry and biomedicine.

After a Master project focused on diagnostic tools for cancer, during my PhD I used medicinal chemistry for therapeutic purposes. I prepared molecules of high complexity, which strengthened my synthetic chemistry skills, but I was also trained on cell culture techniques, which has been essential for my oncology-focused career.

Following from my PhD, I was certain that I wanted to continue in the medicinal chemistry field for cancer and I joined the spin-out company OxStem. This was a remarkable opportunity to participate in drug discovery projects and learn about the processes used under industrial standards. I led the whole oncology team, which aimed to identify small molecules that differentiated CSCs of blood cancers. In three years, we progressed a project through assay set up and optimisation, high-throughput screen, hit identification and validation, and hit-to-lead optimisation. We identified new lead molecules that are only the second reported example with activity across patients independently of their mutation profile.

At OxStem, I became familiar with CSCs and their key role in resistance to chemotherapy and relapse, as well as with the big difficulties of finding selective enough drugs against them; I decided that I would focus my research career on developing innovative chemical strategies to eradicate them in an effective and safe manner. I thus obtained a Marie Curie IF to initiate some of this work at IQAC, where I learned about the emerging field of photopharmacology, which I hypothesised that would allow me to eliminate these cells selectively. Back then, there were no examples of light-responsive molecules targeted to CSCs and only a handful of reports for bulk cancer cells. In 2019, I initiated my independent research lines to develop light-responsive molecules for cancer. I started with HDAC inhibitors, where the first publication had a big impact in the media, and I am now leading projects for different targets.

Working on photopharmacology, I have become familiar with both its big advantages as well as its challenges. To go beyond this work, for this Ramon y Cajal project I propose to add an extra layer of selectivity to the drugs by exploiting a mechanism that is unique to CSCs. I will take advantage of their overexpression of the enzyme ALDH to selectively accumulate drugs in these cells; combined with a light-responsive drug, this strategy should achieve an unprecedented level of precision for these cells; therefore, this therapy could be much effective and better tolerated than conventional small molecules.

This work will set the grounds for the research that I aim to lead in the future, where I will develop novel chemical strategies that exploit specific features of CSCs to. For this work, I count on biologists and clinicians as collaborators working on CSCs of different tissues.

**Resumen del Currículum Vitae:**

Dr Laia Josa-Culleré graduated in Chemistry at the Universitat de Barcelona (2008-2012), finishing with the highest mark of her year and receiving the End of Degree National Award and Extraordinary End of Degree Award.

She did a Master in Organic Chemistry (2012-2013) at the University of Cambridge funded by La Caixa Foundation. Her research project was in the field of biorthogonal labelling of biomolecules via click reactions and identified for the first time the diazo group as a chemical reporter for glycan imaging in cancer cells.

She obtained a PhD in Organic Chemistry (2013-2016) from the University of Oxford, funded by a Marie Curie IDP. She synthesised mimics of natural products with a tetramate core and evaluated their antibacterial and anticancer properties. She identified compounds with antibacterial activity against resistant bacteria, at higher potency than the original natural products, which were transferred to CO-ADD for further development. Also, in collaboration with the TDI, she established a high-content screen to evaluate the effect of small molecules on the cell cycle of cancer cell lines. During her PhD, she was awarded the Lilly Prize for excellence in organic chemistry research. She was a visiting student at State University of New York (US) and TU Delft (Netherlands), where she designed a new cofactor recycling system for enzymes.

After her PhD, she was a Postdoctoral Researcher (2016-2019) at the University of Oxford, working for the spin-out company OxStem in drug discovery projects. In this position, she was project leader of a team of 20 technicians, postdocs and PIs in an interdisciplinary project that identified novel drugs that differentiate leukemic cells in AML in vivo. Unlike other differentiating drugs, the lead compounds were effective in wider patient populations regardless of their mutation status. The developed screen was then transferred to the company Charles River Laboratories. This work resulted in a preclinical candidate and two patent submissions. Moreover, extensive target deconvolution studies identified the molecular target of the molecules, which had never been associated to differentiation of AML cells.

She then held a Marie Curie IF (2019-2022) and a Juan de la Cierva Incorporación (2022-2025) at IQAC-CSIC, leading a project to develop novel drugs against cancer cells, which can be activated with external light. So far, she has identified the first molecules that eliminate cancer cells only when illuminated with visible light, and the first blue-light-activatable autophagy inhibitor. She is also leading the synthetic chemistry of 4 projects in collaboration with hospitals, research groups, and companies, one of which resulted in a patent application for first-in-class TSPAN1 inhibitors against resistant laryngeal tumours.

She has 17 publications, 3 patent applications, and 14 conference presentations. She has supervised 12 students (including 2 PhD theses) and was a lecturer for Bachelor students at University of Oxford and for Bachelor, Master, and PhD students at Universitat de Vic and ESCI-UPF. She also participates in outreach activities for school children and the general audience. She is president of the Early Career Scientists of SEQT and a board member of the Young Scientists Network of EFMC, where she organises activities to promote medicinal chemistry in Spain and in Europe.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | FRANCOS QUIJORNA, ISAAC |
| **Referencia:** | RYC2023-045911-I |
| **Correo Electrónico:** | isaacfq87@gmail.com |
| **Título:** | Inflammatory reprogramming as a therapeutical approach to Neurodegenerative diseases |

**Resumen de la Memoria:**

Since the beginning of my research career, I have always been involved in some aspect of inflammation in the central nervous system. During my doctoral studies at the Universitat Autonoma de Barcelona (UAB), my focus was on investigating inflammatory resolution programs related to neurodegenerative diseases and traumatic spinal cord injuries. This is where I gained comprehensive knowledge about microglial activation and the inflammatory response.

In 2017, I relocated to the UK to join the renowned King's College London. Supported by an MRC/ERA-NET-Neuron fellowship, I explored the interactions between the extracellular matrix and microglial cells following insults to the central nervous system. In addition to expanding my understanding of the inflammatory response, I also acquired expertise in gene therapies relevant to the project I was developing here. Moreover, amid the COVID-19 pandemic, my invaluable expertise in the innate immune system led me to participate in an international project led by Prof Adrian Hayday at the Crick Institute. The project aimed to assess how SARS-CoV-2 affects the immune system and identify early risk-based patient stratification markers. This participation provided me with a broader perspective on immunology, opening my mind to new therapeutic approaches.

In 2022, I was honored with the prestigious Juan de la Cierva Incorporacion fellowship and joined the Immunometabolism and Inflammation laboratory at CBMSO. My research project focuses on studying the impact of immune cell aging in neurodegenerative diseases, with the ultimate goal of developing therapeutic interventions targeting the immune system. This project provided me with the necessary insights into metabolism for the development of my new project.

My new project combines everything I have learned throughout my research career to develop a novel therapeutic approach that sets me apart from everything I have done before in my career.

**Resumen del Currículum Vitae:**

My career to date has focused on studying the immune system in disease and injury contributing to the field in several ways. As a MSc student, my research at St Pau's Hospital (Barcelona) led to the genetic diagnostic of a neutrophilic mutation in siblings, contributing to a successful early therapeutic intervention. As a PhD candidate, I focused on investigating impaired neuroinflammation after spinal cord injury (SCI), under the direction of Dr Rubèn López Vales. My project funded by FPI Spanish Grant obtained the highest mark (unanimous cum laude) in the Doctorate in Neurosciences (UAB) and revealed that dysregulated inflammation after SCI involves inappropriate synthesis of anti- inflammatory cytokines and pro-resolving lipid mediators and targeting them can improve functional outcome. During that time, I published 14 scientific articles, 2 as first author (Francos-Quijorna et al, Glia, 2016; Francos-Quijorna et al, Journal of Neuroscience, 2017), 1 more currently under review as first author and 11 as co-author, including one in PNAS (Coll-Miró M et al, 2016). Additionally, my contributions have led to 3 patents related to the use of Maresins for the treatment of nervous system pathologies. As a Postdoctoral Research Associate, funded by ERA-Net Neuron fellowship, I moved to the prestigious King¿s College London (KCL, UK), under the direction of Prof Elizabeth Bradbury. I identified a novel role of the extracellular matrix in mediating non-resolving inflammation after traumatic SCI (Francos-Quijorna et al, Nat. Communications, 2022) which will have a significant impact in the neuro-regeneration field. Two further publications have been published and one more is currently in preparation fruit of this work on collaborative projects with international consortium members. In 2020, I was awarded a prestigious KCL Early Career Research Award to drive a project as an independent Principal Investigator and clearly distinct from my supervisor's research interests, showing my ability to develop independent research. In collaboration with the KCL UK Dementia Research Institute, I developed a novel project exploring matrix-immune interactions in degenerative tauopathies During the COVID-19 pandemic in 2020, I participated in a project leaded by Prof Adrian Hayday (Crick Institute) to evaluate how sars-cov-2 impacts the immune system and identify signature traits to early risk-based patient stratification. My pivotal role in this project led to a co-first author publication in Nature Medicine (Laing A.G, (..), Francos-Quijorna I, et al, 2020) and co-author in Cancer Cell (Abdul-Jawad S et al, 2021), The Lancet Oncology (Monin L. et al, 2021) and PNAS (Joseph M et al, 2022). Then, in 2022, my interest in understanding the role of immune cells in nervous system disorders motivated me to join the Immunometabolism and Inflammation lab led by Dr Mittelbrunn. Funded by Juan de la Cierva-Incorporación fellowship, I am investigating the role of senescence T cells in the onset and progression of Alzheimer Disease. Additionally, I had the honor of being invited as a Guest Editor for a research topic featured in Frontiers in Aging, supervised 1 PhD, 2 MSc, and 1 BSc student, along with delivering over 110 hours of lectures in undergraduate programs at both UAB and UAM universities.

**Resumen de la Memoria:**

More than ten years ago, I was a graduate student studying HIV pathogenesis—that is, trying only to learn how the virus makes us sick. I scarcely hoped when I started that we as a field would begin to discuss the prospect of someday curing HIV, but that discussion nevertheless began soon enough. We now possess a new armamentarium of tools and hopeful results that offer multiple paths to our goal. My career in HIV/SIV research has been greatly enhanced by the invaluable international exposure I have accumulated over 10 years, and is characterized by a strong sense of independence and a commitment to leadership, both in driving forward innovative research and in guiding the next generation of scientists. My early work at the Institute of Biomedicine of Seville in Spain laid the foundation for my later success. Moving to the University of California, Davis in the USA marked a significant transition, allowing me to delve into pioneering research. This move afforded me the invaluable opportunity to act as Principal Investigator (PI) in five research projects. I have been rewarded with an extraordinary record of independent grant funding totaling $410,000. My collaborations with UCSF and the IrsiCaixa AIDS Research Institute in Spain highlight my commitment to global research initiatives. I have contributed to the writing and acted as Project Leader for four NIH grants. This dedication to research has resulted in the publication of 28 JCR. I have achieved an H-index of 14.

I am entering what I anticipate to be an extraordinarily productive period of my career, where my research is increasingly yielding significant advancements. Over the course of the past two years, I have proposed and secured funding to support a new direction for my work on T-cells that retain antiviral efficacy in chronic HIV infection. I propose that metabolic regulators such as metformin and rapamycin, which directly or indirectly affect the crucial immunometabolic regulator, mTOR, can maintain anti-HIV T-cells in a fully functional and highly proliferative state—likely required for post-treatment control. This hypothesis is a direct outgrowth of my previous work on immunomodulation imposed by cytomegalovirus, and it addresses a central conundrum in the field of therapeutic HIV vaccines: how to elicit stem-like T-cells in the context of a damaged immune system. Early findings show that CD8+ T-cell responses to SIV Gag peptides do not solely determine SIV control, but the quality of these cells, especially their TCF-1 expression, is crucial. Initial trials with metformin treatment in combination with a novel mRNA-LNP/Gag vaccine regimen have shown promising results, indicating improved quality in SIV-specific memory CD8+ T-cells. This aligns with our hypothesis that metformin-induced modulation of mTORC1 signaling could enhance the efficacy of therapeutic vaccination.

Throughout my career, I have had the privilege of receiving exceptional and enriching mentorship. I am fully committed to providing the same quality of mentorship to the students under my supervision. For this reason, I have undertaken an exceptional amount of research teaching, and mentoring. In addition to teaching, I maintain a steadfast dedication to service at the university. I have actively participated in various hiring committees, and I am also a part of the DEI Committee  at UC Davis.

**Resumen del Currículum Vitae:**

My career has been greatly enhanced by the invaluable international exposure I have accumulated over 10 years. My early work at the Institute of Biomedicine of Seville in Spain laid the foundation for my later success. During this period, I conducted a cross-sectional study in collaboration with the pediatric units at Madrid and Seville on a group of children who were vertically infected with HIV-1. Our research highlights the importance of maintaining undetectable viral loads to prevent premature aging and impairment of the CD8-mediated immune response. I also contributed new data relevant to the ongoing inflammation in treated HIV-infected patients with low CD4 T cell restoration: ongoing microbial translocation and T-reg dysfunction in the restored CD4+ T cell population. During this period, I first authored seven JCR, co-authored another four, and participated in 16 conference presentations.

During my post-doctoral fellowship at UC Davis with Dr. Hartigan-O' Connor, I conducted research on the role of gut microbiota and Th17 cells in HIV/SIV infection. Our findings, published in Science Translational Medicine, showed that gut microbes have a long-lasting impact on T-cell development. I also investigated the impact of CMV infection on RhCMV-based SIV vaccine efficacy. My work showed that effective adaptive immunity relies on a suitable host innate and immunometabolic environment. I spearheaded the analysis of SIV-infected macaques treated with novel CD3/CCR5 bispecific antibodies, which shows promising strides toward single-shot treatments for SIV. I explored latency-reactivating agents in collaboration with Dr. Satya Dandekar, contributing to our understanding of HIV latency. Moreover, I was instrumental in studies published in Nature Medicine, where we explored the impact of obesity on T cell aging and immunosuppression. Throughout this phase, I authored five peer-reviewed papers, co-authored nine others, and actively participated in over 10 scientific conferences.

Currently, my research efforts are focused on the regulation of T-cell fate in diverse metabolomic environments, with the ultimate goal of contributing to the development of effective therapeutic HIV vaccines. My more recent independent funding has been used to support gathering preliminary data. My overall hypothesis is that effective therapeutic HIV vaccines must elicit T-cell responses that are fundamentally different from those generated in the normal course of infection—different in functional capacity, homing potential, and proliferative potential or "stemness."

As of today, our laboratory includes five Ph.D. candidates, three of whom I am mentoring. I have been the principal investigator for four grants, contributing to a total of nine significant grants throughout my career. This dedication to research has resulted in the publication of 28. My research impact, as indicated by my H-index, has seen a notable increase to 14 during this period. My commitment to academic mentoring and supervision has been equally robust. I have successfully guided three Ph.D. students to completion, with three more Ph.D. theses currently under my supervision. In addition to teaching, I maintain a steadfast dedication to service at the university. I have actively participated in various hiring committees, and I am also a part of the DEI Committee in the MMI Department at UC Davis.

**Área Temática:**      **Biomedicina**
**Nombre:**      BLASCO LÁZARO, MARÍA TERESA
**Referencia:**      RYC2023-044890-I
**Correo Electrónico:**      teresablascolazaro@icloud.com
**Título:**      Búsqueda de nuevas dianas terapéuticas contra el cáncer y la metástasis

**Resumen de la Memoria:**

My research focuses on unraveling the complexities of breast cancer, with an emphasis on understanding the challenges posed by metastasis. Metastasis remains an obstacle in global healthcare despite advancements in cancer diagnosis and treatment. The project explores the dynamics of metastasis, particularly the processes involved in the dissemination of tumor cells, with a key focus on the amplification of the MAF gene in breast cancer patients.

MAF amplification correlates with increased metastasis risk, especially to the bone, and lower overall and disease-free survival. Elevated MAF levels lead to resistance to bisphosphonates, a bone metastasis prevention treatment. Increased MAF serves as a predictive marker for metastatic risk, crucial for bisphosphonate therapy decisions, particularly in younger patients.

The research introduces the concept of metastasis-to-metastasis, particularly in the context of the bone microenvironment, a crucial site for breast cancer metastasis. The project aims to unravel breast cancer cell seeding and the establishment of metastasis in various organs, not only in the context of MAF amplification but also in drug resistance. By focusing on the contribution of the bone microenvironment, the study seeks to elucidate the mechanisms driving metastasis beyond the skeletal domain, providing a comprehensive understanding of disease progression and resistance emergence.

To address these challenges and identify therapeutic opportunities, the research has outlined specific objectives, including the identification of seeding cells in multiorgan metastasis and drug resistance using single-cell lineage barcoding, and exploring potential therapeutic targets with clinical relevance in metastasis. The proposed approach integrates omics data, pathway analysis and clinical validation to identify surface receptors and molecular targets for therapeutic manipulation.

My professional trajectory began during my PhD at the CNIO, where I studied KRas-driven pancreatic cancer. Notably, our work on MAPK signaling in pancreatic tumorigenesis demonstrated the significant antitumor effects of combined Egfr and Raf1 inhibition with low toxicity, providing a potential therapeutic strategy for pancreatic cancer patients. This work received recognition and a patent, and I was honored with the CNIO Award for Excellence in Research.

Subsequently, as a postdoctoral scientist in the laboratories of Dr. Arkaitz Carracedo and Dr. Roger Gomis, I delved into the molecular mechanisms of colon and breast cancer metastasis. Notably, our research uncovered the critical role of ERK activation in facilitating colon cancer cell seeding and colonization in the liver. In parallel, I embarked on understanding MAF amplification in breast cancer metastasis, generating a mouse model and employing integrative approaches like proteomics and transcriptomics. Our study, published in Nature Cell Biology, disentangled the MAF/E2-mediated metastasis molecular framework, highlighting the integration of genetic, epigenetic, and hormonal cues in determining metastatic success and patient prognosis.

Throughout my career, I have received prestigious fellowships, contributed to international conferences, engaged in science outreach, taught at the Universidad Autonoma of Madrid and disseminated research results to non-scientific audience to promote their relevance.

**Resumen del Currículum Vitae:**

In my Ph.D. research under the direction of Dr. Barbacid, I focused on KRas-driven pancreatic cancer (PDAC), revealing that combined inhibition of Egfr and Raf1 led to complete tumor regression in a murine model of PDAC. Targeted deletion of Egfr and Raf1 had minimal toxic effects, making it promising as a low-toxicity therapeutic strategy for advanced PDAC. This work, published in Cancer Cell (Blasco* et al., 2019, Cancer Cell. *first author), received acclaim in scientific journals and the press, resulting in a patent and the 2019 CNIO Award for Excellence in Research.

Transitioning to the study of metastasis mechanisms, I joined the laboratories of Dr. Carracedo and later Dr. Gomis. Investigating colon cancer, I discovered that ERK activation facilitates liver colonization by promoting ANGPTL2 and CXCR4 expression (Urosevic*, Blasco* et al., 2020, Cancer Research, *first author). Simultaneously, I delved into MAF amplification in breast cancer metastasis, uncovering its interaction with the estrogen receptor and the involvement of KDM1A in epigenomic remodeling. This research, in which I was central from concept to manuscript, has been published in Nature Cell Biology (Llorente*, Blasco*# et al., 2023, Nature Cell Biology. *first and # corresponding author) highlighted in Cancer Discovery and recognized at the prestigious San Antonio Breast Cancer Symposium 2023.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | BARBAZAN GARCIA, JORGE |
| **Referencia:** | RYC2023-043346-I |
| **Correo Electrónico:** | jorge.barbazan@gmail.com |
| **Título:** | Jorge Barbazán-Cancer cell biology and biophysics |

**Resumen de la Memoria:**

I am an experimental scientist, specialized in cancer cell biology. After graduating with honors in Molecular Biology at the University of Santiago de Compostela, I joined the lab of Dr Miguel Abal and Dr Rafael Lopez, in the health research institute of Santiago with a FPU fellowship, to develop a research line focused on the molecular characterization of circulating tumor cells (CTCs) in metastatic colorectal cancer. During that time, I participated in several projects related to liquid biopsy in which I developed a methodology to isolate and quantify CTCs, generating a panel of markers, which then led to the development of PrediCTC, a liquid-biopsy based kit to determine patient's prognosis. This was later validated on a multicenter clinical trial after obtaining funding from a "CaixaImpulse" (La Caixa Foundation) grant. As well, I developed a discovery project aimed at elucidating the biology of CTCs through high throughput gene expression analysis. I discovered a new cancer dissemination mechanism, based on the adhesion of CTCs to fibronectin patches present at the luminal side of blood vessels. This work was then published in "Cancer Research", one of the reference journals in the field. During my PhD I performed short stages in Munich (TUM, 2011, DAAD fellow), and Paris (Institut Curie, 2013, EMBO fellow).

After finishing my PhD I moved to the lab of Dr Danijela Vignjevic (ERC grantee, Institut Curie, Paris, FR), first as a "Fondation de France" fellow, and then as a "Marie Curie" fellow, to work on the field of tumor microenvironment. My main project there focused on Cancer Associated Fibroblasts (CAFs), elucidating the mechanical mechanisms of their interaction with cancer cells and the consequences that such mechanical interplay had for tumor development. This work was recently published in "Nature Communications". During my time at Curie I developed a network if international collaborations that led to publications in prestigious journals such as Cell, Nature Communications, EMBO Molecular Medicine or Science Advances, which allowed me to position myself in the field of tumor microenvironment and mechanobiology.

In 2020 I moved back to Santiago de Compostela to establish my own research line at the Health Research Institute (IDIS), thanks to a "Juan de la Cierva incorporación" fellowship. Since then, I have established several research lines in the field of CAFs, biomaterials and tumor mechanobiology. I already published some of those results as first author (Biomedicine and Pharmacotherapy, 2022, Q1, D1), and a second is currently under second revision in the same journal.

The project I propose here is based on the preliminary results I generated during these years, and will take advantage of my combined expertise in translational research and biophysics. It will investigate how mechanobiology can be applied to solve clinical problems from a wide perspective, using a combined approach at the interphase of cancer cell biology, biophysics, biomaterials, advanced therapies and translational research. I believe that this project will lay the foundations for the research lines of my future laboratory as an independent PI, centered on the application of tumor microenvironment mechanobiology into the clinical setting.

**Resumen del Currículum Vitae:**

2008: Degree in Biology, specialized in Molecular Biology. University of Santiago de Compostela (with honors, Galician graduation prize).

2009-2014: PhD candidate, Translational Medical Oncology Lab, Health Research Institute of Santiago de Compostela (PIs: Dr Miguel Abal & Dr Rafael López). Studying circulating tumor cells (CTCs) as cancer biomarkers, diagnostic tools, and deepening into their metastatic mechanisms (Cum Laude, PhD award, University of Santiago de Compostela) (Funded by a competitive FPU fellowship).

- Predoctoral Stages:

  - 2011: Technical University of Munich, TUM, Germany. Funding: DAAD fellow. 3 months. Supervisor:
  Dr Klaus Peter Janssen. Development of colorectal cancer orthotopic models.
  - 2013: Cell migration and invasion laboratory, Institut Curie, Paris, France. Funding: EMBO Short-
  Term fellow. 4 months. Supervisor: Dr Danijela Matic Vignjevic. Development of complex microscopy
   techniques to visualize hepatic tumor metastasis.

- 2015-2020: Postdoctoral Fellow. Dr Danijela Matic Vignjevic's lab. Institut Curie, Paris, France (https://institut-curie.org/team/matic-vignjevic). Funding: 2015-2017: "Fondation de France fellow". 2017-2019: "Marie Curie fellow". 2019-2020: Staff researcher. During this time I specialized in tumor microenvironment and cancer mechanobiology, studying how the mechanical interplay between Cancer Associated Fibroblasts and cancer cells dictates tumor progression. During this time I supervised 2 master students and 1 technician, and coordinated a multidisciplinary project involving cell biologists, physicists and clinicians.

- From 2020: Postdoctoral researcher, Oncomet group, Health Research Institute of Santiago de Compostela (http://www.oncomet.es/). PI: Dr Miguel Abal. Funding: "Juan de la Cierva Incorporación). As part of this team, I am developing my independent research line focused on the study of the tumor microenvironment, and on the application of mechanobiology concepts to possible Clinical applications.

Overall, I have published 25 original peer reviewed papers, and 2 review articles, with an H-Index of 17 and 1300 citations (Google scholar). From those, I am first author in 8 papers, in high Impact factor journals like Nature Communications or Cancer Research, and a co-author in papers published in Cell, Science Advances, EMBO Molecular Medicine, Nature Communications or Elife. I have as well participated in several EU projects (ERC StG (STARLIN, 1,5M€ and ERC CoG, 2M€, and 1 Euronanomed consortium (Gliosilk, 800k€), as well as in multiple national (Spain: IMPANC, 1,8M€ and France: ANR: 150k€+ 600k€) projects. I am an inventor in 2 patents, and I am a scientific advisor for the startup Nasasbiotech. Finally, I am a reviewer for several journals, including Cancer Research, Life Sciences Alliance, Cancers, Journal of Cell Science, Biology of the Cell... among others. I also review projects for the Latvian Science foundation, for the Luxembourg fonds de la recherche, and the Dutch cancer society. I am as well an active member of the Spanish Association for Cancer research (ASEICA), where I organise the "Meet the Expert" seminars. I am a member of the Training Unit at the IDIS, and I develop a series of internal and external outreach activities for different society groups, from school students to general society.

**Área Temática:** **Biomedicina**
**Nombre:** ESPADAS VILLANUEVA, ISABEL
**Referencia:** RYC2023-043138-I
**Correo Electrónico:** isabel.espadas@cabimer.es
**Título:** Fundamentos moleculares de la memoria y el proceso degenerativo

**Resumen de la Memoria:**

La trayectoria de la candidata se centra en el estudio de los mecanismos moleculares que subyacen a la función cognitiva y motora, así como a las enfermedades degenerativas que los afectan. Estos trabajos incluyen tanto la evaluación de aspectos relacionados con la etiología de la enfermedad como su tratamiento especialmente dirigido a la búsqueda de agentes farmacológicos que han mostrado importantes resultados retrasando la aparición de discinesias, su severidad e incluso reversión. Además, estudia la sintomatología cognitiva asociada a la EP, especialmente relacionada con la disminución dopaminérgica y sus receptores.

Posteriormente se produce un avance desde los aspectos más funcionales de la cognición hacia los mecanismos moleculares que los sustentan y sus alteraciones. En este sentido, la siguiente etapa se centra en los ARN no-codificantes implicados en la homeostasis neuronal. Los resultados demostraron de forma pionera como los lncARNs exhiben características tradicionalmente atribuidas a los mARNs contribuyendo de forma directa a los procesos de neurotransmisión y plasticidad, lo que cambiaría algunos paradigmas fundamentales sobre la dinámica de estos ARNs. Este descubrimiento fue galardonado con el premio Robert M. Sandelman a la excelencia científica (The Scripps Institute) y le lleva a la participación en el "Alzheimer's Drug Discovery Training" (Lottie French Lewis Grant) dirigido al desarrollo de nuevas estrategias para el tratamiento de la Enfermedad de Alzheimer (EA) con el que se pretende dar aplicación clínica a estos descubrimientos.

En su actual posición como investigadora postdoctoral en CABIMER lidera una línea propia con la que se consiguió la contratación de 2 técnicos y 3 graduados superiores, además de participar en objetivos de proyectos otorgados al laboratorio receptor. Todas estas líneas se encuentran enfocadas al estudio de agentes neuroprotectores para la EA y la EP siguiendo con las líneas anteriores. De estos trabajos actualmente hay varios artículos en revisión/preparación y se han generado 3 TFMs.

La línea propuesta para un futuro pretende unificar las dos principales temáticas seguidas durante la carrera investigadora de la solicitante: el estudio de la EP y los ARNs no-codificantes en el mantenimiento de la homeostasis celular. La EP es una enfermedad compleja con una importante presencia de alteraciones en el metabolismo celular entre sus posibles causas. En los últimos años ha existido un incremento de estudios sobre la parte no-codificante del transcriptoma, como mirARNs, sin embargo existen muchos otros para los que aún desconocemos el impacto de sus alteraciones sobre nuestra salud, como los ARN circulares (cirARN). Estos ARNs tienen una estructura circular que les confiere una elevada estabilidad y resistencia a la degradación, haciéndolos idóneos para intervenir en procesos de regulación transcripcional y modificaciones postraduccionales. Esto facilita su estudio y posible uso como biomarcadores en la predicción del origen, desarrollo y severidad de la EP. Esta línea seria altamente novedosa, ya que hasta el momento el papel de estos ARNs y su vinculación con el proceso neurodegenerativo es prácticamente desconocido, por lo que abriría nuevas vías con gran potencial para la intervención no solo para la EP, sino también para otras enfermedades neurodegenerativas.

**Resumen del Currículum Vitae:**

Isabel Espadas es doctora en Psicofarmacología por la Universidad Complutense de Madrid y desarrolló su tesis doctoral en el Instituto Cajal (CSIC). Tras este periodo realiza una estancia postdoctoral de más de 4 años en el prestigioso Scripps Research Institute (EEUU). En febrero de 2021, la Dra. Espadas pudo retornar al sistema nacional de investigación uniéndose al CABIMER gracias a un contrato con la FPS obtenido en concurrencia competitiva.

Sus trabajos de investigación abarcan tanto aspectos básicos, como traslacionales y clínicos sobre la cognición y las enfermedades que la afectan e incluyen la participación en 17 proyectos nacionales e internacionales. Estas investigaciones han proporcionado importantes avances en el estudio de los mecanismos moleculares que subyacen a los procesos de plasticidad neuronal, principalmente asociados a la dopamina y a cambios transcripcionales de RNAs no-codificantes. Estos últimos estudios, actualmente en Nature Comunications (temporalmente disponible en abierto, PMID: 36993323), demostraron de forma pionera como los lncRNAs son capaces de exhibir características que tradicionalmente han sido atribuidas de forma exclusiva a los mRNAs. Estos descubrimientos suponen un cambio en algunos de los paradigmas fundamentales sobre la dinámica de los RNAs y fueron galardonados con el premio Robert M. Sandelman a la excelencia científica (The Scripps Research Institute, EEUU). Por otro lado, su conocimiento sobre el neurotransmisor dopamina y la plasticidad neuronal ha favorecido el desarrollo de nuevas terapias dirigidas a mitigar la sintomatología en pacientes con enfermedad de Parkinson, especialmente las derivadas del tratamiento con L-DOPA, gracias al estudio de novedosos potentes agentes antidiscinéticos. Los trabajos mencionados han generado hasta la fecha un total de 16 artículos de investigación, de los cuales 6 son de primer autor, 8 están en el primer decil y 6 del primer cuartil. Además, han sido presentados en congresos tanto nacionales como internacionales de prestigio (Ej. IBRO, SFN y Keystone) y en seminarios invitados en centros de gran relevancia como el Instituto de Neurociencias Max Planck (USA).

Desde el inicio de su estancia en CABIMER hasta el día de hoy ha obtenido financiación gestionada por la FPS para la contratación de 5 investigadores en formación (3 con estudios de grado y 2 técnicos superiores). Por otro lado, la Dra. Espadas es responsable de la formación de jóvenes investigadores procedentes del programa Erasmus+ de la Unión Europea, Máster en Biología Biosanitaria de la Universidad Pablo Olavide y el Máster en Genética Molecular y Biotecnología de la Universidad de Sevilla de los que han derivado 4 TFMs en los dos últimos años.

Además, la Dra. Espadas ha formado o se encuentra actualmente formando parte de grupos y sociedades formales y consolidados sobre el papel de la mujer en la ciencia (3NiWS) y estudio de los animales de laboratorio (SECAL) o el Centro de Investigación Biomédica en Red para enfermedades Neurodegenerativas (CIBERNED). También ha pertenecido a comités de evaluación científica para la FPS de la Junta de Andalucía, forma parte del panel editorial de las revistas Brain Sciences y Jove, y ha realizado diferentes trabajos de revisión para otras 10 revistas más.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | BAYONA FELIU, ALEIX |
| **Referencia:** | RYC2023-045855-I |
| **Correo Electrónico:** | aleixbyn@gmail.com |
| **Título:** | The interplay between epigenetic regulation and genome integrity as anticancer target |

**Resumen de la Memoria:**

Mi interés científico pretende entender los mecanismos epigenéticos que ayudan a prevenir la inestabilidad genómica, una característica intrínseca de las células cancerosas. Durante mi carrera científica, he investigado en profundidad los mecanismos que ayudan a preservar la integridad del genoma, particularmente aquellos relacionados con la regulación epigenética (Bayona-Feliu et al. Nat Comm 2017; Salas-Armenteros et al. EMBO J. 2017; Perez-Calero et al Genes&Dev 2020; Giannini, M. and Bayona-Feliu, A. et al. 2020 PloS Gen; Bayona-Feliu et al. Nat Gen 2021; Bayona-Feliu, A. et al. Nat Comm 2023). Destacablemente, en 2011 descubrí una función esencial del complejo remodelador de la cromatina SWI/SNF, que se encuentra entre los factores más frecuentemente alterados en cáncer, sobre este proceso (Bayona-Feliu et al Nat Gen 2021). Este descubrimiento tuvo un alto impacto en los campos de biomedicina y cáncer, y estuvo muy presente en los medios de comunicación (El País, Antena3) y redes sociales. Además, se hicieron diversos artículos en otras revistas de alto prestigio (Nature Genetics, Cancer Discovery, Faculty Opinions) discutiendo la magnitud e importancia del descubrimiento. En paralelo, recientemente he publicado un nuevo artículo científico como autor de correspondencia mostrando que las alteraciones de la cromatina se correlacionan con mutagénesis asociada a transcripción en células tumorales (Bayona-Feliu, A. et al. Nat Comm 2023). Consistentemente, los resultados de mis investigaciones científicas sostienen que una regulación de la cromatina adecuada es crítica para prevenir escenarios de inestabilidad genómica y mutagénesis. Actualmente, estoy investigando las interacciones epigenéticas que sostienen la proliferación de las células tumorales y previenen la inestabilidad genómica mediante escrutinios combinatoriales de CRISPR de alta resolución, utilizando la leucemia, y los canceres de ovario y pulmón como modelo.

Con esta ayuda, pretendo emprender mi propia linea de investigación en los campos de inestabilidad genómica, epigenética y cáncer, pero des de un punto de vista más aplicado y traslacional respecto a mi trayectori científica previa. En concreto, pretendo construir un proyecto de investigación partiendo de la base que la modulación del epigenoma puede ayudar a tratar con la inestabilidad genómica inherente de las células tumorales. Este proyecto propone una aproximación revolucionaria y de vanguardia para estudiar las bases de la regulación epigenética y como éstas contribuyen a la estabilidad del genoma. En particular, quiero descifrar las vulnerabilidades de los tumores asociadas a las interacciones entre la regulación del genoma y la integridad del genoma y investigar el potencial terapéutico de éstas. Para ello, quiero caracterizar los determinantes epigenéticos de la inestabilidad genómica, evaluar las interacciones genéticas entre el epigenoma y la reparación del DNA, analizar las interacciones genéticas entre oncogenes y supresores de tumores con la regulación de la cromatina, estudiar las alteraciones genómicas y transcriptómicas asociadas a deficiencias epigenéticas en cáncer y, por último, explorar el potencial terapéutico de estos resultados. Con este proyecto espero descubrir nuevas estrategias para eliminar selectivamente las células tumorales y poder proponer nuevas terapias para tratar esta enfermedad.

**Resumen del Currículum Vitae:**

En 2010 me gradué en biología por la Universidad de Barcelona y un año más tarde, en 2011, obtuve el Máster en Genética y Biología del Desarrollo en esta misma universidad. En setiembre de 2011 empecé el doctorado en el laboratorio del Dr. Fernando Azorín Marín en el Instituto de Biología Molecular de Barcelona, asociado al CSIC, donde investigué la contribución de la histona H1 de Drosophila al mantenimiento de la estabilidad del genoma. En 2016, defendí la tesis doctoral satisfactoriamente y obtuve el título de doctor por la Universidad de Barcelona. Esta etapa me proporcionó experiencia con organismos modelo com Drosphila y Xenopus, además de un gran conocimiento de técnicas de biología molecular.

Posteriormente en 2016, me uní al laboratorio de Inestabilidad Genómica y Cáncer del Prof. y Dr. Andrés Aguilera en el Centro Andaluz de Biología Molecular y Medicina Regenerativa, dónde investigué el papel de los factores de unión al RNA THOC1, UAP56 y TDP-43, y los remodeladores de la cromatina en la prevención del daño en el DNA asociado a R-loops. Los resultados de mi línea de investigación principal durante este tiempo se publicaron en revistas de alto impacto y estuvieron muy presentes en los medios de comunicación y redes sociales. Durante esta etapa, gané concimiento acerca de los mecanismos de reparación y prevención del daño en el DNA, y obtuve experiencia trabajando con células humanas, y organismos modelo como levadura (S. cerevisiae; S. pombe) y C. elegans. Además, di clases de genética (Genética I; 28h; 2019-2020; Genética Molecular; 30h; 2020-2021) en el grado de Biología de la Universidad de Sevilla y supervisé dos estudiantes de doctorado (Carmen Pérez Calero (MSKCC, USA) y Marta Giannini (IJM, Francia). También atendí conferencias nacionales e internacionales, y actué como revisor de manuscritos para revistas científicas de alto impacto.

Actualmente estoy trabajando desde 2021 como investigador asociado en el grupo del Dr. Fran Supek doblemente afiliado al Instituto de Investigación Biomédica de Barcelona (IRB BARCELONA) y al Biotech Research & Innovation Centre (BRIC) de Copenhague, Dinamarca. Mi línea de investigación actual consiste en estudiar las interacciones genéticas entre las enzimas de síntesis de DNA trans-lesión en cáncer. Destacablemente, estoy integrado en dos consorcios internacionales de investigación en cáncer (DECIDER; LUCIA). En este momento estamos preparando el manuscrito para publicarlo. Mi estancia en este grupo me ha permitido familiarizarme con las técnicas de vanguardia de escrutinio mediante CRISPR y la secuenciación mediante Oxford Nanopore. Además, superviso el trabajo de los investigadores junior del grupo. De hecho, soy investigador principal de un proyecto subvencionado por el Gobierno de España (PID2020-118795GB-I00) con una beca FPI asociada (PRE2021-097628). También he sido miembro de 6 tribunales de tesis doctorales, y he supervisado los trabajos de investigación de dos estudiantes de bachillerato. Gracias a este grupo he atendido numerosas conferencias nacionales e internacionales y poseo una gran red de colaboraciones (4 nacionales y 2 internacionales).

Esta trayectoria investigadora ha sido posible en parte gracias a la financiación obtenida del Gobierno de España mediante las convocatorias FPU (AP2010-5466), JdC-Formación (FJCI-2017-34536) y JdC-incorporación (IJC2020-044963-I).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | BUENDIA , IZASKUN |
| **Referencia:** | RYC2023-045228-I |
| **Correo Electrónico:** | izaskunbuendia@hotmail.com |
| **Título:** | Estudio de nuevos mecanismos histopatológicos y biomarcadores para enfermedades del sistema nervioso central relacionados con la neuroinflamación y daño en la mielina. |

#### Resumen de la Memoria:

My scientific career has evolved around a simple yet incredibly complex question: what are the molecular cues that lead to neurodegenerative diseases? Throughout my career I have been focused on discerning the molecular cues that drive neurodegeneration and brain ischemia and defining new therapeutical strategies to treat them. During my predoctoral and postdoctoral periods at prestigious national and international institutions (Universidad Autónoma de Madrid, Cornell University of New York, Hospital Universitario La Princesa, Cyceron in France and CiMUS at University of Santiago de Compostela), I have gained a multidisciplinary background, which allows me to tackle the relevant questions that I propose here, from different perspectives and employing diverse yet complementary experimental approaches. Furthermore, I have become an expert in basic and cutting-edge techniques in molecular biology, as well as in in vitro and in vivo models that will be used during the next step in my career as an independent researcher. As a RyC researcher, with all the scientific and non-scientific skills that I already possess, I will focus on a critical, but largely unrecognized mechanism of disease: neddylation, which is a newly described ubiquitination-like post-translational mechanism, whose deregulation is implicated in many pathological conditions, including tumorigenesis, neurodegeneration or heart failure. My aim is to answer the question whether neddylation is one of the main drivers in central nervous system (CNS) diseases related to neuroinflammation and myelin damage, such as multiple sclerosis (MS) and traumatic brain injury (TBI). Furthermore, I will demonstrate whether differences in neuronal vs glial neddylation, are relevant therapeutic targets or/and can serve as a predictive or prognostic biomarker for the treatment of this patients. It is important to note that, as far as I know, being such a recent topic, I will be in charge of one of the few national laboratories working on the field. My research career is summarized below:

- Total published Articles : 38 (89 % in Q1)
- First author Publications: 11
- Corresponding author Publications): 1
- h-index: 25 / Citations: 2,172
- Grants as researcher: (>10 nationals and >4 internationals)
- Grants as Co-Principal investigator: 2
- Patents: 3 national and 1 international
- Number of publications peer-reviewed (as a Reviewer): >5
- Guest-editor in international-journals: 2
- Students co/supervised: 2 TFM, 1 rotating PhD, 2 Ph.D student (2021 and 2024-currently)
- Number of research centers I have worked at: 9 (5 international / 4 national)

#### Resumen del Currículum Vitae:

Buendia I. graduated in Biology at the Universidad Complutense of Madrid in June 2010. She later performed a three-month research stay at the University of Los Angeles, USA. In 2011 she completed the Official Master's Degree in "Pharmacological Research" at the Autonomous University of Madrid. She then obtained a FPU-MCIIN fellowship to do her doctoral thesis in the laboratory of Dr. G. López and Dr. Egéa at the Faculty of Medicine of the Autonomous University of Madrid. She defended her thesis on October 23, 2015, obtaining the qualification of International Doctorate with Outstanding Cum Laude and later she was awarded with two prizes: best doctorate from the Autonomous University of Madrid and best doctorate from the Royal National Academy of Medicine. During her Ph.D she performed two international pre-doctoral international stages: 4 months under the supervision of Dr. Iadecola at Cornell University, New York and a month under the supervision of Dr. Zarcovich at the University of Zagreb, Croatia. She was awarded with a post-doctoral contract from the Teófilo Hernando Foundation from January 2016 to November 2017. After, she received the accreditations of "Doctor Assistant" and "Contract Doctor" from the National Agency for Quality Assessment and Accreditation (ANECA) at the end of 2017. Later she obtained a post-doctoral contract Juan de la Cierva- « Formación » (11/ 2017 to 11/ 2019). During the post-doctoral stage, she has made 2 international stays, with independent funding from the Spanish Ministry (José Castillejo 2017) and European funds "EMBO-Short term fellowship" in the laboratory of Dr. Vivien, Caen, France. The results have been disseminated in different international congresses, such as the FENS FORUM 2012, the AAIC 2014, FAAD 2016, Glia 2017, Keystone 2018 International Congresses; as well as in national (GENN and FARMADRID), through more than 40 posters and oral communications and a guest presentation at the Spanish Congress of Pharmacology in July 2019. She is co-author of 38 scientific articles Index H: 25, 89% Q1 ) (11 first author (90% Q1) and one correspondence author) and three national and one international patent. She has also actively participated in the teaching activities of the department, in the subject "Experimental Techniques in Pharmacology" of the official Master "Pharmacological Research" and in 3ª degree of medicine. In addition, she has tutored 2 master's degree projects . She is also a reviewer of scientific articles in >5 international journals and has been 4-thesis board member. Later, she has enjoyed a postdoctoral contract at the French National Institute of Health and Medical Research in Cyceron, Caen, France since December 2019-April 2021. She is currently continuing her scientific career in Spain thanks to obtaining a postdoctoral contract Juan de la Cierva Incorporation 2019 of the Ministry of Innovation Science in Dr. Ashwin Woodhoos laboratory at CiMUS, Universidad de Santiago de Compostela, where she has started her independet career prompted by Dr.Woodhoo and she co-directs 2 doctoral thesis.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | MENÉNDEZ CARAVIA, XURDE |
| **Referencia:** | RYC2023-042853-I |
| **Correo Electrónico:** | menendezcaravia@gmail.com |
| **Título:** | Understanding the roles of nuclear envelope proteins and DNA damage in cardiomyopathy |

**Resumen de la Memoria:**

During my Bachelor's degree in Science (Biology) and my Master's in Biomedicine and Molecular Oncology I became very familiar with the molecular mechanisms that lead to human pathology, including cardiovascular diseases. After that, I decided to pursue my passion for science which had accompanied me for years by joining Dr. Carlos López-Otín Lab to pursue my Ph.D.. During my doctoral studies, I focused my research on the functional characterization of the microRNA miR-29 in aging-associated pathologies, being my main focus cardiac disease. Completing my Ph.D. equipped me with a comprehensive training regarding cardiovascular research, including mouse genetics, physiological studies, cellular assays, and cutting-edge molecular biology approaches.

Driven by my enthusiasm for cardiovascular research, I decided to broaden my horizons and move to the US for my postdoctoral training. For that reason, I joined Dr. Eric Olson's laboratory at UT Southwestern Medical Center, which represented a huge step in my scientific career. Dr. Olson's lab is globally recognized as one of the leading research groups in the cardiac field. Importantly, this laboratory has made remarkable contributions regarding heart development, cardiac regeneration, and reprogramming. Recently, the Olson Lab opened a new research avenue aimed at elucidating the roles of nuclear envelope proteins (NEPs) in cardiac pathophysiology. Over the last four years, my goal was to unveil the specific roles the NEP LEMD2 plays in the heart and determine why a mutation in its coding sequence leads to severe cardiomyopathy in both humans and mice. All the findings of this scientific project, which I led, are included in an article published in 2022. Importantly, some of the results derived from this study have led to the protection of intellectual property and I am co-author of the patent "Gene therapy for LEMD2 cardiomyopathy" (PCT/US2023/078001).

For the Ramón y Cajal scientific proposal, I want to build on my previous experience and study the causal relationship between DNA damage and cardiomyopathy using LEMD2 as a model. Mutations in the LEM domain nuclear envelope protein 2 (LEMD2), an inner nuclear membrane protein expressed across tissues, lead to severe cardiomyopathy. The exact role of LEMD2 in the heart and the mechanisms by which its mutations cause disease remain unclear. Preliminary data suggest that DNA damage in cardiomyocytes with LEMD2 mutations contributes to cardiomyopathy. My research will characterize DNA damage in cardiomyocytes from both mice and humans with LEMD2 mutations. It will also explore the relationship between LEMD2 function, DNA damage, and cardiomyopathy, including potential disruption of the LEMD2 interaction with the chromatin-binding protein BAF, and subsequent effects such as nuclear envelope ruptures and inflammatory pathway activation. Lastly, I aim to correct the LEMD2 mutation using prime editing in vitro.

**Resumen del Currículum Vitae:**

Through my scientific career, I have accumulated expertise, training and leadership that will ensure success in completing the scientific project I am presenting. During my Ph.D. studies and as a result of my hard work, I have published, in major peer-reviewed journals, one first-author research article, two first-author reviews, two co-authored research papers and one co-authored review all related to my five-year Ph.D. work. I also learned how to write grants and apply for fellowships. In fact, four years of my Ph.D. were funded by the FPU fellowship, the most competitive public predoctoral fellowship in Spain. I have mentored two undergraduate students (Alba Morán-Álvarez and David Roiz-Valle), whose undergraduate dissertations (Trabajos Fin de Grado) I co-directed were both honor-awarded, and participated in 47 hours of laboratory practice instruction. I completed a three-month predoctoral training at the University of North Carolina at Chapel Hill (UNC) under the supervision of Dr. Mohanish Deshmukh. The results of this collaborative short-stay were included in a manuscript which is currently under revision and available on bioRxiv. All these previous accomplishments crystallized in my doctoral dissertation, which I completed in June 2019. My doctoral thesis received the cum laude, International Mention, and the University of Oviedo Extraordinary awards, and was also awarded by the Real Academia de Medicina y Cirugía del Principado de Asturias as the best basic science Doctoral Thesis presented atm the University of Oviedo in 2019.

During my postdoctoral period, I also co-authored three papers focused on the utilization of gene editing tools to combat cardiovascular disease. Importantly, I was also awarded the American Heart Association (AHA) Postdoctoral Fellowship, which is very competitive especially for international researchers. I am wholeheartedly committed to the mentorship of new researchers and, during my postdoc, I have mentored one Research Assistant and one Postdoctoral Researcher.

Finally, I am a strong advocate for the principle that the value of science extends well beyond laboratory research. Reflecting this conviction, I have been honored with the position of vice president of the Postdoctoral Association at UT Southwestern. In this role, I am committed to leveraging my four years of postdoctoral experience to organize meaningful events and advocate for enhancements to our working environment. Thus, I was part of the Organizing Committee of the 2023 National Postdoc Appreciation Week (NPAW) Research Symposium at UT Southwestern. Due to my scientific experience, I am reviewer for journals such as Aging (Albany NY) and Frontiers in Pharmacology, and guest editor for Frontiers in Aging. In addition, I am proud to have established 'Villaviciosa ConCiencia,' an initiative founded with the goal of making scientific advancements accessible and engaging to the community in my hometown.

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | IBARROLA ULZURRUN, JAIME FRANCISCO |
| **Referencia:** | RYC2023-043288-I |
| **Correo Electrónico:** | jaime.ibarrola.u@gmail.com |
| **Título:** | Study of the mechanisms of obesity-associated vascular stiffness |

**Resumen de la Memoria:**

My long-term career goal is to become an independent vascular physiologist that studies the impact of obesity on cardiovascular disease. My PhD publications showed for the first time a new role of Mineralocorticoid Receptor (MR) in mitral valve prolapse. These studies showed for the first time the role of MR as a therapeutic target. The findings obtained, expand my knowledge of the main pathways involved in heart failure and valve disease that allow me to apply for my future research line (impact of obesity in cardiovascular disease). Furthermore, the results obtained opened new therapeutic target options that are more translational to clinics. During my postdoctoral fellow, I showed for the first time the beneficial effects of MR antagonists in patients with vascular stiffness. My postdoctoral publications, expanded my knowledge of vascular physiology as well as additional techniques in epigenetics, bioinformatics (Digital Spatial Transcriptomics) and physiology (echocardiography and pulse wave velocity). All contributions have aimed at finding new therapeutic targets for heart failure, valvular disease, and vascular disease as well as describing/discovering new mechanisms in these cardiovascular diseases. I am seeking support for studies to pivot towards my independent research career exploring the mechanisms by which obesity promotes cardiovascular disease in a sex-dependent manner. My long-term career goal is to become an independent researcher and to launch my own research group exploring how obesity leads to increased risk of vascular disease and the sex differences in the development of vascular stiffness. My mentors Dr. Natalia Lopez-Andres and Dr. Iris Jaffe have been studying the Aldosterone/Mineralocorticoid Receptor (Aldo/MR) pathway in CVD and I would like to differentiate myself from them by moving away from the study of Aldo/MR. Obesity is characterized by excessive accumulation of adipose tissue. PVAT is a unique adipose tissue (AT) depot that surrounds vessels. Under normal conditions, PVAT produces adipokines that promote normal vascular function acting in an autocrine/paracrine manner in the vascular wall, and also in an endocrine fashion, controlling vasocrine signaling of entire vascular beds. However, in obesity, the PVAT mass increases and it becomes dysfunctional which manifests as alterations in adipokine release, some of which promote vascular stiffness. Crosstalk between PVAT and vessels has been studied, although the focus has generally been unidirectional, from PVAT to vascular cells. And the impact of sex and sex hormones remains unknown. The mechanisms driving sex differences in vascular stiffness associated with obesity are unknown, limiting sex-specific therapies that may be more effective. A better understanding of obesity-induced vascular stiffness mechanisms, including the bi-directional crosstalk between the vessel and PVAT and the impact of sex differences has the potential to identify novel treatment targets. I propose to test the hypothesis that obesity-induced changes in PVAT alter the bidirectional crosstalk between vascular cells and adipose tissue to contribute to aortic stiffness by regulating sexually dimorphic gene programs in SMC, ECs and fibroblasts.

**Resumen del Currículum Vitae:**

General quality indicators: H Index: 17; i10 index: 21; Research Interest Score: 315.8; Total Cites: 669; Publications: 28; Senior thesis Committee: 1; PhD Committee: 1

I entered the PhD Program at the Public University of Navarra (UPNA) and joined the lab of Dr. Natalia Lopez-Andres in Spain. My PhD research project explored mechanisms of valvular heart disease and allowed me to develop experimental skills to study heart valve biology in mouse models and in vitro in primary cell culture, through biochemical assays, proteomics analysis and basic bioinformatics. My PhD training resulted in the publication of 18 manuscripts, 6 of which as the first author and a book chapter. The final manuscript of my PhD project was published in Circulation Research (Q1, D1) and I graduated with the highest honor of "cum laude". This project was presented at many international conferences including The Heart Valve Society meeting (Oral), European Section of Aldosterone Council (ESAC) (Poster), Aldosterone Cost Action Meeting (Oral and poster).

From there, I chose to pursue postdoctoral training at Tufts Medical Center in Boston in 2019. My postdoctoral research project focuses on the elucidation of molecular and epigenetic mechanisms of vascular aging. This project has thus far resulted in the publication of 2 first-author manuscripts in Cardiovascular Research (Q1) and Hypertension (Q1) journals and another one under review (in Clinical Science) and an invited review article (Annuals Reviews of Physiology Vol.86). Associated with this project I was awarded the Postdoctoral Fellowship from the American Heart Association (AHA) (Role: Principal Investigator). The candidate presented his work at AHA Scientific Sessions (Oral, Boston), Experimental Biology (Poster, Philadelphia), VASCULATA (Oral, Virtual), International Vascular Biology Meeting (IVBM) (Poster, Oakland) and Matrix Tissue and Pathobiology Meeting (Poster, Salt Lake City). Part of this project was presented in two seminars where Dr Ibarrola was invited as a speaker (Admire Network Virtual Forum and InFocus session from NAVBO organization). Furthermore, I was awarded with the GALL Trainee Award for Excellence in Cardiovascular Research by the American Society of Investigative Pathology.

Apart from research, I am very invested in the improvement of several aspects of the scientific community, such as, mentorship, diversity and equity, and communication of science. Supervision of students and organization of data club meetings have been additional tasks carried out during my Post-doctoral activity, being a board member of the Postdoctoral Association of Tufts University and President of the Boston Chapter of ECUSA (Spanish Scientis in USA). I have a commitment to mentoring as evidenced by my direct supervision of Rachel Xiang from 2021-2022 as part of her Senior Thesis and Xiaoou Su as a part of her Master project. I was a member of the PhD tribunal defense of Tania Sanchez at University of Valladolid. I am Ad hoc reviewer for European Journal of Pharmacology, Cardiovascular Drugs Therapy and Molecular Frontiers Journal and currently I am guest editor in Biomedicines and Frontiers in Molecular Medicine journals. And I was invited as a speaker in the Admire Network Virtual Forum (2023) and in the InFocus session from North American Vascular Biology Organization (NAVBO) (2023).

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | ORTEGA DE SAN LUIS, CLARA |
| **Referencia:** | RYC2023-043114-I |
| **Correo Electrónico:** | claraortegadesanluis@gmail.com |
| **Título:** | Understanding the Molecular Basis of Memory: Signalling Mechanisms of Engram Cells |

**Resumen de la Memoria:**

I have dedicated my research trajectory to understanding the mechanisms underlying memory function, with a particular focus on the molecular and cellular processes involved in learning and amnesia.

2012-2016
Funded by a competitive FPU Fellowship (Spanish Government), I completed my PhD with Prof. Alberto Pascual (2016, Instituto de Biomedicina de Sevilla, CSIC). As a predoctoral researcher, I investigated molecular and cellular signalling mechanisms that allowed neuronal function and survival in the context of neurodegenerative diseases. My research significantly advanced our understanding of signalling trophism in the nigrostriatal pathway and the microglial response, with important predictions for Parkinson's and Alzheimer's Disease therapy. My work resulted in the publication of four high-impact articles, three of which I am the main author.

2017-2023
I relocated internationally to Trinity College Dublin (Ireland, #104 World, #18 Europe). I joined Tomas Ryan lab, a world-recognized expert in the memory engram field, to investigate how memories are stored in the brain.

My postdoctoral stage was funded by a competitive Government of Ireland Postdoctoral Fellowship to investigate transynaptic proteins involved in memory formation. this grant allowed me to lead my own research lines, mentored by Prof. Ryan. I have led 3 independent research lines, and in total, intellectually and technically contributed to 8 out of 11 of the research lines of the lab.

I have authored numerous impactful publications (81% of my research appearing in Q1 journals). By studying engram cells – the building blocks of memory, my work has shed light on the synaptic connectivity, adaptability and immune modulation of these cells and that has impacted not only theories of learning and memory, but also holds implications for neurodegeneration, neurodevelopment and nervous system evolution.

I established +4 collaborations with researchers from international institutions. I contributed to scientific events, chaired sessions, and held institutional responsibilities. I supervised +5 students, help managed PhD students, and served as a reviewer for reputable journals. I have also participated as examiner committee member in a thesis evaluation.

My contributions extend to society, with coverage of my research in +60 mass media outlets. I actively engage in science communication activities, including interviews, speaking engagements, and involvement in initiatives dedicated to improving higher education.

2024-present
I obtained a NHMRC-Ideas Grant as a PI (joined by 3 other PIs from U.Western Australia and U.Melbourne, 1,129k AUD). Securing this international competitive funding allowed me to initiate my own independent research.

My proposed research line focuses on understanding how the neuropeptide Ang IV regulates engram cells to enhance therapeutic strategies for memory loss in amnesia. The objectives include characterizing neuropeptide signalling, studying Ang IV's function in engram cells, and exploring the role of engram cells in RAS-induced cognitive improvement. The methodology involves utilizing engram technology for genetic manipulation, combined with the study of neuropeptide signalling, to unravel the mechanisms underlying memory and potential therapeutic interventions.

**Resumen del Currículum Vitae:**

CURRENT POSITION
2024-Present    Junior PI. School of Biochemistry and Immunology, Trinity College Dublin (TCD), Ireland.

PREVIOUS POSITIONS
2022-2023    Postdoctoral Research Associate. TCD, Ireland
2019-2022    Government of Ireland Postdoctoral Fellow. Research Associate, TCD, Ireland
2017-2019    Postdoctoral Research Associate. TCD, Ireland
V–XII 2016    Postdoctoral Researcher. Instituto de Biomedicina de Sevilla (IBiS), CSIC
2012-2016    PhD Student. IBiS, CSIC
2010-2011    Researcher. U Sevilla

ACADEMIC EDUCATION
2012-2016    PhD in Biology. U Sevilla
2010-2011    MSc in Biomedical Research. U Sevilla
2009    Seneca Student. Universidad de Granada

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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2006-2010    BSc in Biology. Universidad de Jaén

AWARDED GRANTS AS PRINCIPAL INVESTIGATOR
2024-2028    NHMRC Australian Ideas Grant 2023 (Trinity College Dublin, in collaboration with 3 PI, 1,129k AUS Dollars)

FELLOWSHIPS AND AWARDS
2019-2022    GOIPD Fellowship (Government of Ireland)
2012-2016    FPU predoctoral grant (Gobierno de España)
2010    Mención Premio Nacional a la Excelencia Académica (Gobierno de España)
2009-2010    Seneca grant (Gobierno de España)

PUBLICATIONS
- h-index: 8, 211 citations (Google Scholar)
- I have published 11 papers
- 81% are published in quartile 1 and 54% in decile 1 journals
- I have published in reputed journals in the field (Current Biology, Science Advances, Nature Communications, Cell Reports, Nature Aging, Journal of Biological Chemistry…).

INTERNATIONALIZATION
- I have 8 years of research experience in an international top-ranked university
- I am a PI of an international project, with PIs from U Western Australia and U of Melbourne
- I have an international network of collaborators (Trinity College Dublin, U Western Australia, U Leeds, U Melbourne, U College London)

INDEPENDENCE AND LEADERSHIP
- I am a PI since 2024 (NHMRC Australian Ideas Grant - Trinity College Dublin, Ireland)
- I have co-supervised 1 master student project (visiting from Sorbonne Université, Paris)
- I have supervised 4 undergraduate students projects (Trinity College Dublin, U Zaragoza)
- I have supervised 1 student placement (visiting from U Barcelona, Spain)
- I have been involved in the establishment of the lab I did my Postdoctoral research (space design, acquisition of instrumentation, protocol establishment…).

OPEN SCIENCE STRATEGIES
- 80% of my publications are Open access
- 4 out of my 6 experimental works published after 2020 (66%) have been PrePrinted

SCIENCE COMMUNICATION
- My work has been presented in 24 international conferences
- My work has been covered in 60+ articles in renowned media (Medium, Scientific American, EurekAlert, El Pais, ABC, La Sexta Noticias, Xataka, The Irish Times…etc.)
- I have been interviewed by Telecinco Noticias
- I participated in outreach events in secondary schools (Spain; Ireland)
- I have been invited speaker in Ciclo de Conferencias de Enseñanza de Posgrado, U Jaén
- I have organized the International Career Day 2022 Conference and a workshop series (Trinity College Dublin)

OTHERS
- I have taught at both graduate (Trinity College Dublin, U Sevilla) and master levels (Trinity College Dublin, U Jaén)
- I serve as external reviewer for international peer-reviewed journals
- I served as external examiner and committee member in PhD thesis (Spain)
- Vicepresident of the Trinity Postdoc Researcher Society
- Member of the Athena Swan Committee (Trinity College Dublin)

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Biomedicina** |
| **Nombre:** | LANDERAS BUENO, SARA |
| **Referencia:** | RYC2023-044971-I |
| **Correo Electrónico:** | sara.landeras@uchceu.es |
| **Título:** | Understand and Defeat Human Viruses with Pandemic Potential |

**Resumen de la Memoria:**

During 15 years of scientific career, I have integrated Immunology, Molecular and Structural Biology to find therapeutic targets for the causative agents of the epidemics/pandemics of the 21st century: Influenza virus, Ebola virus, and Coronavirus.

During my graduate studies at the National Center for Biotechnology (CSIC) in Spain, I determined an essential human protein's molecular mechanism of action for the early stages of Influenza virus infection. To my knowledge, silencing this human factor has the highest impact described in the influenza viral multiplication. I also repurposed an FDA-approved drug as an antiviral to combat the Influenza virus. Unraveling its molecular mechanism of action led to the discovery of a new pathway suitable for anti-influenza virus intervention.

In my postdoctoral research at the prestigious The Scripps Research Institute in the US, I have solved three novel crystal structures of essential proteins for the Ebola virus at atomic resolution. This high-resolution information helped me to point out conserved and essential residues as the best targets for pan-filovirus treatments.

As a Research Faculty at La Jolla Institute for Immunology (LJI) in the US, I was entitled to apply for independent funding and create my research team at La Jolla Institute for Immunology, San Diego, USA. I secured funding from the National Health Institute in the US (NIH) granted from 2023 to 2025. This funding allowed the discovery of a new panel of 88 monoclonal antibodies that we licensed and used to visualize for the first time a disordered protein of coronaviruses whose structure has been hindered since the discovery of coronaviruses. I also solved an innovative Cryogenic EM (Cryo-EM) of a novel immunocomplex of SARS-CoV-2 at high resolution.

To achieve these investigations, I secured numerous sources of independent funding: a SPARK Award for Innovation in Immunology ($25K), a COVID-19 Advancement Project"($50K), and an R21 NIH grant ($515K). I mentored two research assistants and a postdoctoral researcher. Furthermore, I communicated my discoveries in multiple national and international meeting, and International Ph.D. programs. In addition to my pioneering work in the laboratory, I became the founding member, professional development manager, and treasurer of Españoles Cientificos en USA (ECUSA) at San Diego, to promote outstanding Spaniard scientists in the US.

As a Group Leader at the University CEU Cardenal Herrera, I envision to generate immunotherapies and vaccines based on conserved proteins of RNA viruses with pandemic potential. The project we are proposing offers the opportunity to generate pan-coronavirus treatments that target conserved internal proteins, the viral nucleoproteins (Ns) that provide a more mutation-resistant therapeutic option for current epidemics and expected future waves of coronaviruses. To achieve this goal, I recently hired my first PhD student, and I am securing new independent sources of funding. In addition, I will continue exploiting my collaborative network in the US and Latin America, while expanding my local network of collaborators.

**Resumen del Currículum Vitae:**

During my scientific career, I have combined multidisciplinary technologies to find therapeutic targets for the causative agents of the epidemics/pandemics of the 21st century: Influenza virus, Ebola virus, and Coronavirus.

I obtained my Ph.D. in Molecular and Cellular Biology at the National Center for Biotechnology (CNB-CSIC) in Madrid, Spain, with the renowned virologists, Professor Juan Ortín Montón. My research applied genetic and pharmacological strategies to block influenza virus infection. Importantly, my studies lead to three first-author publications and three publications as co-author in top virology journals. I also communicated my findings as a speaker in nine national and international conferences. To support these studies, I was awarded with a "Formación Profesorado Universitario" (FPU) fellowship (MICINN), and a CIBER fellowship for a short-term stay at Howard Hughes Medical Institute in The United States (US).

For my postdoc, I joined the lab of Professor Erica Ollmann Saphire, at The Scripps Research Institute in the US, with the goal of mastering structural biology and immunology techniques. At a first stage, I solved the crystal structure of two different Ebola Virus proteins and identified potentially druggable targets. Then, during the COVID-19 pandemic, I was selected as an essential worker in charge of the rational design of SARS-CoV-2 therapeutics. At that stage, I coordinated an interdisciplinary team and applied cryo-electron microscopy, proteomics and monoclonal antibody discovery. These efforts led to the first Cryo-EM map of SARS-CoV-2 nucleocapsid (publication under review) and two patents of chimeric anti-SARS-Cov-2 antibodies with therapeutic potential. Importantly, all these studies led to eight publications in high tier journals. To achieve these investigations, I secured numerous sources of independent funding: a SPARK Award for Innovation in Immunology ($25K), a COVID-19 Advancement Project"($50K), and an R21 NIH grant ($515K), and mentored two research assistants and a postdoctoral researcher. In addition to my pioneering work in the laboratory, I became the founding member, professional development manager, and treasurer of Españoles Cientificos en USA (ECUSA) at San Diego, to promote outstanding Spaniard scientists in the US.

Because of my contributions to the lab, I was promoted by unanimous approval of Research Faculty-Instructor at La Jolla Institute for Immunology, a stepping stone to independent faculty. Despite the opportunity to become a Group Leader in the US, I was recruited from the University CEU Cardenal Herrera in Spain to start a new line of research in Pandemic Preparedness. As a Group Leader, the mission of my lab is to identify universal and rapid vaccine interventions for the prevention of future viral threats. For this, I will apply the molecular, structural biology and immunology techniques that I mastered throughout my career. To reach these goals, I recently hired my first PhD student, and I am securing new independent sources of funding. In addition, I will continue exploiting my collaborative network in the US to validate the therapeutic potential of anti-SARS-CoV-2 antibodies and in Mexico to surveille the immunological responses of COVID-19 patients, while expanding my local network of collaborators.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | RODRIGUEZ GARCIA, JULIA |
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| **Correo Electrónico:** | julia.rod.g@gmail.com |
| **Título:** | Caracterización de ingredientes funcionales y reformulación de alimentos |

**Resumen de la Memoria:**

My research focuses on understanding ingredient technological functionality (chemical and physical properties) and food structure formation (microstructure and texture) to develop new reformulation strategies to improve the nutritional profile of food products with the final goal of having a positive impact on the health of the population and the sustainability of the food system. As per the future projection of my research I will work in the development of in vitro methodologies to mimic dynamic multi-scale physics during oral processing (fracture engineering, film and large amplitude oscillatory shear, and tribology) to correlate changes in structure with delivery/diffusion of specific compounds (tastan, bioactive, etc). In addition, I will develop further understanding and expertise in sensory perception (sensory profiling, dynamic perception, consumer acceptability), in order to design healthy, acceptable food products that will ensure recurring purchase habits. The development of mathematical predictive models to understand how a specific physical property could influence an attribute is an avenue to explore for the design of food reformulation strategies that are more cost-effective. The main objectives of the research line will be: (i) To signficanlty improve the nutritional profile of food products by designing, modifying or selecting the most appropiate ingredients with the technological functionalities needed to develop the required product structure; (ii) to design food product structures that consumer perceive during mastication as acceptable and pleasurable; (iii) to design food product structures that deliver certain tastans and biocompounds at certain points in the digestion (in vivo or in vitro mastication); (iv) to modify ingredient technological properties through pre-treatment or processing conditions to promote the formation of certain product structures; (v) to develop molecular chemistry and mathematical modelling to optimise food reformulation strategies.My research has been and will be developed in collaboration with end users of the research outcomes (consumers, ingredient suppliers and food manufacturers) and therefore, the novel outcomes could be transfered very efficiently and successfully to the food industry and have a clear impact on the population. (a) When consumers understand how products are desinged and produced and the impact of their consumption in health they are empowered to make better choices improving their trust in the sector, their diet and lifestyle. (b) Accessible and open food reformulation practices will make the processes more competitive and the outcomes of higher quality. This information will be useful for food industry, and policy makers when developing new regulations to promote the development of healtheir alternatives. (c) A more efficient reformulation strategy will benefit food manufacturers which are constantly investing in new product development to comply with regulations. (d) Embedding new reformulation approaches in the food industry will give place to healthier products in a near future, increasing the product portfolio available in supermarkets. When targeting the reformulation of staple products there is an oportunity to reach to a wider population of diverse background, purchasing power and preferences and thus to have a bigger impact in public health.

**Resumen del Currículum Vitae:**

As a researcher I take an interdisciplinary approach, integrating knowledge from nutrition, thermodynamics, chemistry, and engineering to characterise and design of food structures that are healthier, sustainable and acceptable. I have advanced knowledge in sucrose reduction in bakery products through collaboration with UK and EU industry (IET Food Projects 18175, 19105, 20249; Innovate UK-102693). I developed fundamental knowledge on ingredient physico-chemical properties that was applied at industrial level to develop products at pilot and full scale (TRL 4-6). The work carried out through these projects provided added value to a novel sugar technology (https://www.douxmatok.com/the-technology) that has 14 patents granted. Results were disseminated in industry shows (Food Matters Live), scientific conferences and publications (h-index:13; FWCI: 1.43; DOI: 10.3390/foods10050951 and 10.1016/j.lwt.2022.113837). Several publications (DOI: 10.1007/s11947-013-1066-z and 10.1016/j.lwt.2014.10.045) have been used in four patents on ingredients inventions (starch and leavening agents). Subsequently I developed an interest in the potential of rare sugars as sucrose replacers (DOI: 10.1016/j.lwt.2021.111989). Research output in this area (DOI: 10.1111/j.1750-3841.2011.02546.x) has been used in the development of policy on the challenges and opportunities of food, nutrition and health (https://www.gov.wales/food-future-report). I have also generated knowledge in saturated fat reduction in bakery products through the design of novel fat replacers such as oleogels (Innovate UK-102693) and nanoemulsions (DOI: 10.3390/foods11050681 and 10.1007/s00217-022-04088-7) through collaboration with industry and supervision of a PhD project. I have developed expertise in managing research projects in collaboration with industry and cross-discipline partners (>5.7M € as Co-I and >1M € as PI, from 2015); funders are mainly UK Research and Innovation (UKRI) and EIT Food. I have been following Open Research practices; from 2017 all my publications are open access and I have published data sets associated with my publications (https://doi.org/10.17864/1947.000384).

As part of my contribution to the research sector I have organised sessions in international conferences (34th EFFoST) and I have been invited speaker to industrial events (https://www.youtube.com/watch?v=19q4W1Rz8ys). I have been part of the Supervisor Cohort in a Doctoral Training Partnership (https://research.reading.ac.uk/foodbiosystems/) and a Collaborative Training Partnerships (https://www.campdenbri.co.uk/research/consortium/food-consortium.php) in which we led discussions on delivery of social, environmental, health and economic impacts to influence the scientific communities and policy makers. I am in the scientific committee of the RIPEN HUB and assessor of research project proposals for the Biotechnology and Biological Sciences Research Council (BBSRC-UK).

I led a research group (346.700€ funds awarded for equipment and infrastructure) in which I managed and mentored 4 postdoctoral research assistants, 2 PhD students as first supervisor and 6 as co-supervisor. I have successfully supervised two PhD student up to completion (4 years) and 2 of my past Postdoctoral Research Associate (PDRA). I have been external evaluator of two PhD thesis (Valencia, 2022; Madrid 2015) and internal examiner of another (UoR, 2017). All this work has enabled me to acquire the R3 certification (2023).

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | CABON , ANTOINE PIERRE CLEMENT |
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| **Correo Electrónico:** | antoine.cabon@gmail.com |
| **Título:** | Source and sink controls of tree carbon allocation and turnover |

**Resumen de la Memoria:**

Scientific trajectory

As a researcher, I study the link between photosynthesis and tree growth, which has profound implications on projections of forest growth and carbon (C) sequestration under climate change. Current vegetation models implement the common assumption that tree growth is limited by the C source (i.e., photosynthesis). This causes models to predict a considerable increase in forest C sequestration in the future that is mostly driven by the effect of elevated CO2 on photosynthesis. My work notably provides evidence that tree growth is not really driven by C source but rather by limitations occurring at the C sink level (e.g., during cell division), which needs to be reflected in vegetation models. To this end, I studied biophysical constraints of cambial cell expansion and division and showed that they strongly drive tree growth, independently of photosynthesis. These results notably led to the development of a sink-oriented tree growth model based on the principle of biophysics-driven growth.

In my previous research, I have studied vegetation structure and mortality in response to environmental factors through the lens of tree growth. Notably, I evidenced the role of past tree growth resilience to drought in mediating forest mortality. I also established a model capable of relating tree rooting depth to climate, stand structure and tree hydraulic characteristics. Finally, I have led research on the use of forest thinning as a mean to adapt forests to climate change.

Looking to the future: project SSATURN

In my previous work I have shown the need to account for C sink limitation when modelling tree growth: whether C is allocated to wood or short-term C pools (e.g., leaves) has large implications on simulated C turnover. However, it remains unclear how C sink limitations interact with C source activity and how to implement them in models. Climate change-induced forest die-off may further substantially limit C turnover time. Mechanistic predictions of forest mortality nevertheless remain extremely challenging because of unaccounted functional trait variations. Notably, spatial and temporal variations of C allocation to tissues involved in the water supply fundamentally shape tree hydraulic architecture and have profound implications on tree drought physiology and mortality.

Here, I propose a research program to address Source and Sink controls of tree carbon Allocation and TURNover (SSATURN). SSATURN will reduce uncertainty in C turnover by providing a better understanding of the processes underlying wood formation, C allocation and tree mortality (Box 3). My specific objectives are to (i) establish the mechanisms of source and sink limitations to tree tissue growth, (ii) generalize the concept of source-sink limitations to explain patterns of C allocation and tree structure, and (iii) apply this framework to predict variations in hydraulic architecture and improve tree mortality modelling. To do so, I will leverage long-running physiological monitoring together with a novel set of observations that will enable hypotheses testing and mechanistic model development. Fulfillment of these objectives will represent a leap forward regarding the basic understanding of how trees grow and develop their structure and pave the way to improve vegetation models and C cycle projections.

**Resumen del Currículum Vitae:**

I began my research as a master's student at INRAE (Nancy, France) where I was interested in carbon exchanges between forests and the atmosphere. This led me to realize the scope of functional ecology as a discipline and the importance as well as the urgency to better understand the response of forests to climate change and their importance in the carbon cycle. During the second year of my master's studies (two years are compulsory for a master's in France), I studied the impact of forest management on the physiology and carbon balance of tropical and Mediterranean forests.

I then enrolled as a PhD student at the Autonomous University of Barcelona. During this period, I developed my research on modeling the effect of climatic, edaphic and biotic determinants on forest dynamics. I first used an ecohydrological approach relating climate and forest drought tolerance to model root distribution in Catalonia to improve the forest model 'medfate' developed by Dr de Cáceres. Later I considered the drivers of wood formation and tree growth. Thanks to two stays with at the USDA Forest Service (Oregon, USA) and at INIA (Madrid, Spain), I developed a mechanistic model of wood cell differentiation based on the effect of water potential on cell turgor and expansion. Thanks to a third scientific stay at WSL (Zurich, Switzerland), I was further able to demonstrate that the cell differentiation model that I had developed could further be adapted to simulate cell production and tree growth across a temperature gradient in the Swiss Alps.

Following my PhD, I started a first postdoc with Pr. Anderegg at the University of Utah (Salt Lake City, USA), an internationally leading scientist in forest carbon cycling. This collaboration enabled me to develop and lead my own research line on the physiological drivers of carbon allocation and forest carbon sequestration. Notably, I worked on understanding to what extent the formation of wood is determined by factors independent of photosynthesis. This research line turned out to be highly productive as it led to the publication of three first-author papers, including in Science. Through a collaboration with the US Forest Inventory and Analysis service, I also investigated for the first time at a large spatial scale, the link between tree growth resilience to drought and subsequent mortality events that are widespread in the Western USA and are a rising concern in most biomes.

Upon funding of my research project MiCSS by the Swiss National Science Foundation, I moved back to Europe in 2023 for a second postdoc, at the WSL (Zurich, Switzerland). In this project I aim to upscale mechanisms of cell growth to improve global models of vegetation dynamics, which represents a promising approach to reduce uncertainty of forest growth.

Overall, I have acquired crucial skills, including an ability for independent thinking and leadership, as demonstrated by the several international collaborations I have led and the publication of the results in excellent journals, including Science, Ecol. Lett., Glob. Change Biol. and New Phytol., and funding acquisition —I recently received a fellowship of 270 k€ To this day, my work has led me to publish 17 articles in peer-reviewed scientific journals (of which 14 in D1 and 3 in Q1 journals), with >670 citations since 2019, including 10 as first author.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | MONTORO GIRONA, MIGUEL |
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| **Correo Electrónico:** | miguel.montoro@uqat.ca |
| **Título:** | Forest Disturbance Regimes in the face of Climate Change |

**Resumen de la Memoria:**

I am a researcher in forestry; my research aims to evaluate the impacts of natural (e.g., insect outbreak, fire, windthrow) and anthropogenic (e.g., harvesting) on the structure and function of forest ecosystems using dendroecological, palaeoecological and modelling approaches to provide insights for ensuring sustainable forest management in the context of climate change. The long-term objective of my research career is to improve our understanding of natural and anthropic disturbance regimes in forests at multiple temporal and spatial scales.

My PhD research in Canada focused on the response of the boreal forest to anthropic disturbance (harvesting). I evaluated how new partial harvest–based silvicultural treatments affected stand growth, mortality and regeneration in a large-scale experimental design established by the Canadian Forest Service. I published 4 papers as first author from my PhD thesis, and my research was a finalist in the national scientific contest 'Preuve par l'image.' As a PhD student, I obtained a scholarship at UQAC (Canada), the "Modelling Forest Complexity" Excellence scholarship and two scholarships from the Forest Research Centre to support my participation in research internships (University of Helsinki) and international conferences (Wind and Trees, IUFRO).

For my postdoctoral fellowship, I secured a two-year contract with the Restoration Ecology group at SLU, Sweden, to model the impact of disturbance on forests. I combined this fellowship with another part-time postdoctoral fellowship at UQAT to evaluate the vulnerability of seedlings to insect outbreaks and to reconstruct insect outbreak regimes in Canadian boreal forests. During my postdoctoral internships, I developed new collaborations with the USGS (Wisconsin, USA) and their ecological modelling group as well as one with the dendroecology group at the University of Parana State (Brazil). My postdoctoral work lead to 4 papers published as first author or corresponding author. Also, during my postdoctoral position, I was editor of 2 special issues of international journals and obtained the first funding (as co-applicant), to realize my first MSc project as co-supervisor. I also established an international collaboration to produce a 31-chapter book that guides silviculture in the boreal forest in the context of climate change. This publication involved 148 experts in my field from 16 countries.

Two years after the finishing my PhD, I obtained a tenure track position at UQAT. I established my research program and secured funding from competitive national and regional grants for each of my research avenues (innovative silviculture, natural disturbance regimes and climate change). My research lab has now trained more than 60 students (BSc, MSc, PhD, postdoctorate) under my supervision. In 2021, I founded GREMA, the Research Group in Ecology at UQAT to help to the regional community adapt forestry practices to present-day and future climate change. I received several nominations for international, and national research strategic positions, as deputy coordinator for the silvicultural division of the IUFRO, at UQAT responsible for the SmartForest program. Our book on boreal forest management in the face of climate change was published in 2023 having a major impact in the forest science research community. In 2023, I became a fully tenured professor at UQAT.

**Resumen del Currículum Vitae:**

Researcher in forestry (R3 certificate); full professor at UQAT (University of Québec in Abitibi-Témiscamingue; Canada) since 2019; director of GREMA (Research Group in Ecology) since 2021; Maria Zambrano fellowship (2022); postdoctoral researcher at the Swedish Agricultural University of Agricultural Sciences (Sweden 2017–2019), PhD in forest ecology at UQAC (University of Québec in Chicoutimi; Canada, 2017), Master in Geographic Information Systems (University of Seville) and two undergraduate degrees: environmental sciences (University of Murcia) and technical forest engineering (University of Huelva). I worked three years with the Junta de Andalucía-Agencia de Agua y Medio Ambiente.

I have co-authored 30 articles (more than 90% open access) in international peer-reviewed high-impact journals (63% as 1st, 2nd or last author and 33% as corresponding author), a book (open access), 9 book chapters, and 4 special issues in forest ecology journals (h-index 17; 1020 citations; January Google scholar). My research has been widely disseminated in more than 100 poster and oral presentations in national and international conferences. I am editor or associate editor of 3 forestry journals (For. Ecosyst., Front. Plant Sci., Front. Eco. Evo.). I have been a reviewer for 19 journals (e.g., For. Ecol. and Manag., Sci. Total Environ., Forestry) and served as external evaluator for the Alliance Grant Program (Canada) and the FQRNT Excellence scholarships program since 2020. I have been the evaluator of 4 PhD and 14 MSc theses at several universities (UQAT, UQAC, Laval U, France-Compté and UQAM).

I have an excellent record in securing research grants and contracts, obtaining $2,897,000 CAD for my research program as PI or as co-applicant in the last 5 years. I am PI of 5 scientific projects funded through competitive national grant programs ($1,005,000 CAD), including two NSERC-Alliance grants, MITACS, an NSERC Discovery grant and FODAR. I have secured research contracts (as PI) with regional funding agencies to establish the GREMA Research Group ($650,000 CAD) and from Hecla Mining ($75,000 CAD).

I have active international collaborations; I led a 31-chapter book project, published in 2023 by Springer-Nature, involving 148 experts from 16 countries and leading institutions in forest sciences (e.g., SLU, Wageningen, NASA, Harvard Forests, Montpelier U, U British Columbia). Moreover, in 2021 I was appointed as deputy coordinator of the silviculture division of IUFRO—International Union of Forest Research Organizations.

I have supervised 5 postdoctoral fellows, 9 PhD (8 ongoing) and 10 MSc theses (4 ongoing), 4 BSc theses, 55 BSc students and 2 research assistants in my lab. I have an active teaching program with more than 600 h of lectures given in the master in ecology and the environmental sciences PhD programs

at UQAT-UQAM (Canada), the master of restoration ecology program (SLU, Sweden), the Bachelor of Biology program (UQAC) and the master of natural ressources program (UFP, Curitiba, Brazil).

I have held key responsibilities within research organizations, responsible for the research committee and funding for research equipment of the SmartForest Canada project at UQAT, head of the Forest Research Centre at UQAT, and securing funds for my research group (GREMA), of which I am director since 2021.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | RIBAS MAYNOU, JORDI |
| **Referencia:** | RYC2023-045472-I |
| **Correo Electrónico:** | j.ribas87@gmail.com |
| **Título:** | Sperm chromatin and livestock reproductive outcomes |

**Resumen de la Memoria:**

Research career: My career has been developed in different national and international institutions and is focused on livestock reproduction (particularly, sperm). I performed investigations thanks to competitive fellowships at the Autonomous University of Barcelona as PhD student, at the IBR (USA) as a visiting researcher, at the Spin-off Cimab as a industrial postdoctoral researcher (Torres Quevedo Fellow), at the University of Girona and at the University of Hawaii (PostDoc-UdG fellow and Marie Curie Fellow), and at the University of Murcia (Maria Zambrano Fellow). All the contracts were funded by competitive fellowships, and thanks to them I could develop research on the field of livestock and human reproduction, leading to several research papers and even new products for DNA damage assessment.

Main Research line: The focus of my research is focused on six main topics covering different aspects of reproductive biology in farm animals. The main topics developed are the determination of the reproductive effects of sperm DNA breaks (theme 1) and the study of sperm chromatin structure and specific DNA regions (theme 2). These topics gave rise to understand the relevance of sperm chromatin architecture for reproductive performance and to advance in understanding particularities of sperm chromatin in domestic species, such as pigs or cattle. This evidenced disparities among species regarding sperm DNA condensation and allowed understanding the effects of specific chromatin regions. Additionally, the applicant has also contributed to the understanding of the mechanisms causing sperm DNA breaks (theme 3), to the assessment of the reproductive implications of sperm telomere length in porcine, bovine and other species (theme 4), to the determination of the relevance of specific proteins for sperm physiology (theme 5) and to proteomics and metabolomics in sperm and seminal plasma (theme 6).

Internationalization and leadership: The long experience I acquired in both public and private setting, including mobility at national and international levels, has allowed me to meet a large list of researchers, who are available for future research collaborations. In fact, a highly collaborative work is already reflected in 23 publications with participation of international researchers. Also, I am section editor for Reproductive Biology and Endocrinology, I developed editorial tasks for 12 journals and peer-reviewing tasks for 16 journals. These are important assets in meeting new prestigious researchers, increasing the amount of contacts. After leading a team as industrial postdoc that developed a new product for the assessment of sperm genotoxic damage, I moved back to Academia and supervised 4 PhD, 14 MSc and 9 undergraduate students. Importantly, I have been PI of 6 competitive research projects and contracts.

Future perspectives: I would like to develop a research line assessing the influence of sperm chromatin condensation and chromatin associated proteins to livestock fertility. A better understanding of how chromatin affects livestock fertility, will open path to the development of new groundbreaking methods to improve productivity and lead to possible new products for sperm preservation and to increase fertility outcomes. This will also enhance my experience as researcher, allowing me to get tenured in the public research system.

**Resumen del Currículum Vitae:**

I earned my PhD in Cell biology in 2014 thanks to a competitive predoctoral fellowship from AGAUR, focusing my work on understanding the effects of different types of sperm DNA breaks. It was in this stage when I carried out a research stay at the Institute for Biogenesis Research (USA), which provided me a relevant knowledge to sperm chromatin. My thesis was qualified with an Excellent and Cum Laude and was awarded with an Extraordinary Award. Additionally, due to the quality of my works, I was selected as one of the "Best Young Researchers for 2014" by the Catalan Biology Society. After my PhD, and thanks to getting a national Torres Quevedo project (Ministerio de Industria y Competitividad), I joined Cimab, a spin-off company, where I continued my research in the sperm chromatin damage and I led the development of a DNA damage assessment product that has now been used at different countries. Once finished the Torres Quevedo, I earned a competitive postdoctoral fellowship (Postdoc-UdG) to join Dr. Marc Yeste's Lab at the University of Girona (1 year). There, I achieved a national project as co-PI (€194k) and two national public-private contracts with two companies, also as co-PI. After one year, I earned an international Marie Curie COFUND project (€136k), and I moved to the University of Hawaii, this being a huge step to boost my internationalization. Now, I am a Maria Zambrano Fellow at the University of Murcia. My independence and the quality of my research led to the achievement of the award to the most noteworthy career of the last 10 years (2022 Andrology Award) by the American Society of Andrology and the European Academy of Andrology. My reincorporation to public research five years ago gave rise to several publications in JCR/SCI journals, showing a very high productivity (43 publications in the last 5 years, focused on animal reproduction), enabling me to overcome the gap that industrial policies that kept most of the results as industrial secret caused in the previous stage of my career.
My academic research is summarized in 55 published papers in JCR/SCI journals (64% as main author, 16% as second author; 78% of the publications being in Q1, 40% in D1), 7 book chapters, 2 abstracts published in JCR/SCI journals and 103 contributions to conferences, including three as invited speaker (three communications received an award). My current H-index is 18, the total cites of my papers being higher than 1650. I am Section Editor for RBE journal, I have been Editor for 12 JCR/SCI journals, and I have served as an ad hoc Reviewer for 16 journals.
Thus far, I completed the supervision of three PhD students, one as single supervisor (+1 ongoing), 12 master students (+2 ongoing) and seven undergraduate students (+2 ongoing). Throughout my research career, I took time to lecture for 439 hours, and I earned the accreditations of Profesor Contratado Doctor and Profesor de Universidad Privada (ANECA), and Profesor Agregat (AQU).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | PALMA DOVIS, LEOPOLDO |
| **Referencia:** | RYC2023-043507-I |
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| **Título:** | Novel Pesticidal Proteins for Advanced Sustainable Pest Management. |

**Resumen de la Memoria:**

The microbial insecticide market sales were estimated about USD 400 millions in 2010 and is expected to reach US$ 4.6 billion by 2025 as agriculture moves away from chemical pesticides towards biological control methods. Biological control of pests and crop-diseases is paramount in a transition towards an environmentally-friendly agriculture, to suppress both crop pests and diseases threatening crop production worldwide. Therefore, my research agenda is driven by the needs for reducing the negative impact of insect pests in agriculture to develop groundbreaking strategies for improving biological control. In this way, I started my PhD in 2008 searching for novel insecticidal proteins from Bacillus thuringiensis (Bt) at the group of Prof. Primitivo Caballero (Spain). After a postdoc stay at his lab, I moved to Argentina in 2015 and started a research line from scratch as Associated Researcher at CONICET, leading a research group for searching novel bacteria showing pesticidal activity, mostly from Bacillus, Photorhabdus an Xenorhabdus genera. At that time, I've maintained previous international collaborations with top researchers in the field including professors Colin Berry (Cardiff University), Primitivo Caballero (UPNA) and Juan Ferré (University of Valencia), and signed cooperative agreements with agribiotech companies. Amongst the most important milestones obtained in my career, I can mention the description of a novel vegetative insecticidal protein class designated Vip3C, which enlarged the number of proteins available for the control of lepidopteran pests in agriculture and the description of the first low-resolution structure of the Vip3Ag4 protein. This work showed to researchers working in the field, first structural data on a member of the Vip3 protein family at the level of the surface topology, leading the way for deeper studies. In January 2022 I moved to the CBP group at the University of Valencia (UV) with a Distinguished Research contract María Zambrano (ending 12-31-2024) and my research supported by grant PID2021-122914OB-100, where I am also performing as member of the research team. This project is involving the study of the receptors of Vip3A protein at the insect cell by using i) Proximity Labelling to identify receptors, ii) Cryo-EM to obtain structural data its interactome and iii) performing bioassays with Vip3 protein and knockout Spodoptera littoralis larvae lacking receptors. The information gathered in this project is expected to be useful for retargeting Vip3 proteins for the construction of novel transgenic plants with enhanced insect resistance that may be exploited through patents of intellectual property and I+D agreements with the agribusiness sector, for the benefit of farmers, the economy and society. In addition, taking into account the 5-years duration for the Ramón y Cajal research grants and their starting budget, if my application succeeds, I am very enthusiastic about starting a de novo research line at the UV, to study the insecticidal potential of 16 strains (2 Photorhabdus and 14 Xenorhabdus) we have sequenced in Argentina. Furthermore, in a recent collaboration started with Prof. Helge Bode (Max Planck Institute), we have signed an MTA agreement to transfer the Xenorhabdus strains to his lab and study the potential antimicrobial activities of secondary metabolites from these strains.

**Resumen del Currículum Vitae:**

In 2003 I travelled to Spain with a FPI fellowship at the Public University of Navarra (UPNA) to work in fungal genomics. Later, I changed the subject of research and obtained my PhD in Biotechnology at UPNA in 2013 (cum laude) with a Research and Teaching Assistant Contract (PDI) where I've also obtained the positive accreditation from ANECA. I've carried out research stays at Texas A&M University (USA), University of Tours (France) and Cardiff University (UK) enforcing international collaborations. After a postdoctoral stay at UPNA, I've applied successfully and moved to Argentina with a postdoctoral fellowship from the National Scientific and Technical Research Council (CONICET). I've started my fellowship at the National University of the Littoral and nine months later I've applied successfully for a tenured Assistant Researcher position at CONICET and moved to the IMITAB institute in the National University of Villa María (UNVM), upon a competitive program for the establishment of tenured scientists, which included an interim Associated Professor position and a Starter Settlement Research grant from CONICET. Two years later, I've been promoted to Associated Researcher and applied successfully as Principal Investigator, to different research grants from the UNVM Research Institute, the Secretariat of University Policies, the CONICET itself, and the Ministry of Science and Technology. I've supervised personnel (17 in total) including undergraduate and foreign visiting students, a CONICET postdoctoral fellow, a CONICET Assistant (tenured) Researcher and I am also supervising a PhD candidate and a postdoc remotely. In 2021 I became a member of the Bacterial Pesticidal Protein Resource Center (bpprc.org/about-us) along with top scientist in the field. I've contributed 30 publications in total with a 73% Open Access rate (h-index 13) and with an author contribution rate (Web of Science) of 48% as first author, 36% as corresponding author and 16% co-author whereas other research has been presented in national and international conferences. I've been also invited three times to oral conferences for plenary sessions in Argentina and I served twice as expert-external evaluator and three times as committee member for completion of PhD thesis at Spain and UK and now I am performing the evaluation of a master thesis invited by The University of West Indies (Jamaica). I am also serving as expert reviewer for grants and fellowships at CONICET and the MINCyT in Argentina, the International Centre for Genetic Engineering and Biotechnology (ICGEB) and ACERTA company (Spanish I+D+I certification company). I'm building my editor profile serving as Guest Editor for a Special Issues in Toxins, Plants and Data journals (MDPI) and I have reviewed 77 in 30 different indexed journals. Since January 2022, I am performing research with a Distinguished Research contract María Zambrano (ending 12-31-2024) at the University of Valencia (UV), and my research supported by grant PID2021-122914OB-100 where I'm also a member of the research team for studying Vip3 protein receptors at insect-target cells. At the UV, I was participating in a research agreement with Biogard company and in teaching activities for Biotechnology and Biology degrees, for the Master in Virology and for a cycle of high school visits to the UV intended to reach out students to the university.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | HERNÁNDEZ MESA, MAYKEL |
| **Referencia:** | RYC2023-044255-I |
| **Correo Electrónico:** | maykelhm@gmail.com |
| **Título:** | Unveiling the exposome: Towards major advances in food safety and exposomics brought by cutting-edge analytical methods |

**Resumen de la Memoria:**

My research experience is related to the investigation and implementation of advanced analytical approaches to respond to the challenges and requirements of food safety from the perspective of exposure assessment and hazard identification. Consequently, I have acquired extensive knowledge in different analytical chemistry tools as well as in food, environmental and biological analysis, primarily focused on the determination of chemical residues and contaminants, and more recently in metabolomics approaches for risk analysis. Therefore, I have the scientific background necessary to successfully achieve the "analytical deconvolution" of complex chemical mixtures in food as part of the external exposome and in biological matrices as part of the internal exposome. Furthermore, as an integral part of exposome studies, I have gained the knowledge to link such chemical exposures to their impact on the metabolism, thus providing early insight into the development of environmental diseases. Within this framework, my research interests are aimed at assessing the risks of consumers facing chemical hazards in real exposure scenarios (i.e., exposure to mixtures of chemicals at low doses for long periods) in order to establish prevention measures to promote health. These objectives are part of the line of research that I have begun to develop and implemented in the FQM302 group (University of Granada, UGR) in the context of the MASMETABO ('Ministerio de Ciencia e Innovación'; 88.333,00 €) and 'Descubriendo el exposoma' (UGR) projects.

After my Ph.D. dissertation in 2016, I joined the research group of Prof. Bruno Le Bizec (LABERCA-ONIRIS; Nantes, France) as 'Fundación Ramón Areces' fellow for two years. During this postdoctoral period I gained knowledge about IM-MS technology and its potential to improve the performance of analytical methods for residue determination. In this sense, I was in charge of the IM-MS research line at LABERCA, which is reflected in numerous international collaborations, including two industrial companies (i.e., Bruker Daltonics and Water Corporation), aimed to the development and implementation of this technology in an international context. In 2019, and after 6 months in the 'Biopolymères Interactions Assemblages (BIA)' unit headed by Dr. H. Rogniaux, I re-joined LABERCA with a MSCA-individual fellowship (two years) leading the project HAZARDOmics (185.076,00 €). This project, focused on the application of metabolomics approaches to provide insight into the metabolic effects caused by exposure to PCBs and bisphenol A at low dose levels, was a milestone in my scientific career, as it was my first participation in an international project as PI. More recently, in 2021, I re-joined the FQM302 group (UGR) as 'Juan de la Cierva – Incorporación' fellow. During this period, I have consolidated my scientific career as independent researcher during this period by leading the national MASMETABO project and regional project 'Descubriendo el exposoma'. Furthermore, and due to my expertise in IM-MS technology, I have participated in obtaining a IM-MS platform for the Scientific Instrumentation Center of the UGR [Ref. EQC2021-007196-P; 1.538.403,85 € 'Ministerio de Ciencia e Innovación' (Spain)].

**Resumen del Currículum Vitae:**

My research career began in the research group 'Quality in Food, Environmental and Clinical Analytical Chemistry' (FQM302; University of Granada, UGR), where I carried out my Ph.D. thesis under the supervision of Prof. A.M. García-Campaña and Prof. C. Cruces-Blanco. I defended my Ph.D. thesis on 4th March 2016, obtaining the highest grade ('sobresaliente, Cum Laude', Extraordinary Award by UGR). In October 2016, I joined Prof. Bruno Le Bizec's group (LABERCA-ONIRIS; France), where I enjoyed a 2-years postdoctoral fellowship funded by 'Fundación Ramón Areces' to evaluate the potential of ion mobility-mass spectrometry (IM-MS) in the food safety framework. In October 2018, I was awarded with a 6-months postdoctoral fellowship (University Research Plan, UGR) and I joined the research group headed by Dr. H. Rogniaux (INRAE; France), where I acquired knowledge of IM-MS for glycomics. In this context, I have coordinated and executed an international collaboration (LABERCA, INRAE, Waters Corporation, 'Université de Genève') for the implementation of the collision cross section as molecular identification parameter. In 2019, I was granted a Marie Skłodowska-Curie Actions – Individual Fellowship at LABERCA for applying metabolomics approaches to risk assessment. Since 2021, I am 'Juan de la Cierva – Incorporación' researcher at the UGR. I also act as sole principal investigator of the MASMETABO project ('Ministerio de Ciencia e Innovación'; 88.333,00 €) focused on the evaluation of alternative metabolomics approaches to address chemical issues in a food safety framework. As a result of my research, I have published 35 articles (i.e. 22 as first author, 9 as corresponding author) in high impact factor journals and 6 book chapters. My publications accumulate 928 citations (h-index 16). I have been the presenting author of 22 oral presentations and 28 poster communications in national and international scientific meetings, receiving two prizes for oral communications (SECyTA2013, SECyTA2017), and two poster awards (CAPARICA2014, RAFA2019). I was granted the AGRO New Investigator Award by the Division of Agrochemicals of the American Chemical Society in 2017. I obtained the accreditation R3 from the 'Agencia Estatal de Investigación' (AEI) in 2023. My research has allowed me to establish a wide network of international collaborators including Dr. Cano-Sancho (INRAE), Dr. Dall'Asta (University of Parma) or Dr. Causon (BOKU), among others. I have also collaborated with international industrial companies such as Waters Corporation and Bruker Daltonics GmbH. I am currently participating as lead researcher at the UGR in a trial on IM-MS inter-comparison organized by NORMAN. I have participated in the organization of two scientific meetings (SECyTA2018, MICOFOOD2022) and in the scientific committee of LACE2019. I am currently organizing the 2nd edition of the European School of Metabolomics (2024). I am an evaluator of the AEI and I have acted as evaluator of MSCA-IF 2022 and 2023 projects. In 2018, I obtained the certification from ANECA to 'Profesor contratado doctor' and I have developed my teaching experience in analytical chemistry at the UGR. I have supervised 8 final degree experimental projects, 4 Master Thesis, and a Ph.D. Thesis. I have also acted as scientific supervisor of 5 Ph.D students and 4 postdoctoral researchers during their stay at LABERCA and UGR.

**Resumen de la Memoria:**

Viral disease epidemics pose a significant risk to the achievement of global food security, a primary goal of the United Nations' 2030 Agenda. Thus, there is an urgent need for novel virus management approaches.

Synthetic protein receptors for plant virus immunity were reported; they however (i) displayed slow activation kinetics that could not stop viral spread, (ii) their antiviral activity depended on host defense pathways, whose functionality could be compromised during virus infection, or (iii) required transgenic hosts.

Nucleoside and nucleotide analogues are largely used in the medical treatment of viral infections; they can induce the termination of viral polymerase chain elongation, or lethal mutation accumulation in viral progeny (error catastrophe). Immune systems that synthesize non-canonical nucleotides grant robust antiviral immunity in eukaryotes and prokaryotes. In plants, antiviral nucleosides are functional and are used to clear plant viruses under in vitro tissue culture settings, but with costs that hamper their open-field applicability for crop protection.

Plant and insect viruses are commercialized for agricultural uses in the US market. Given the acceptance of virus-based therapies for clinical uses, it seems reasonable to envision the future application of virus-derived tools in crop therapy approaches for food security and a sustainable agriculture. VIRICS will develop an artificial inter-viral conflict system to confer transgenic DNA-free, plant antiviral protection. VIRICS aims at conditional reprogramming the cellular nucleotide metabolism to grant robust plant antiviral immunity. A first RNA virus will be engineered to sense and trigger the synthesis of noncanonical antiviral nucleotides in presence of a second, naturally occurring virus. Effectiveness of the engineered virus in preventing a secondary infection as well as in curing an on-going infection will be assessed.

Since 2021, FP is leading a personal research line supported by the competitive computational biology grants MiniVi (ELIXIR-IIB, CINECA, ITALY) and DeeVir (BCV-2023-1-0021, SPANISH SUPERCOMPUTING NETWORK, SPAIN). VIRICS is an original and innovative project that builds upon unpublished data generated during the implementation of MiniVi and DeeVir.

VIRICS will advance our comprehension of virus-host interactions and develop innovative solutions that address the urgent need for novel virus management approaches. Knowledge and tools generated within the VIRICS framework will to contribute to ensure food security and promote sustainable agriculture.

**Resumen del Currículum Vitae:**

Fabio Pasin (FP) is dedicated to advancing our understanding of plant antiviral immunity and to developing new solutions for crop protection and breeding. He has authored 20 peer-reviewed articles (h=11; citations=502; source=Google Scholar), 1 chapter. His outputs were published in Q1 journals of Plant Science, Microbiology, and Biotechnology; 86% of his work are in the top 25% most cited documents worldwide (Scopus). FP is the inventor of 6 patent applications, and 2 granted patents licensed for exploitation. FP is the first inventor of SPANISH NATIONAL RESEARCH COUNCIL (CSIC) who gained ownership of his invention IPRs and succeeded, through personal initiative, in their commercialization. FP's leadership skills are evident in his roles as corresponding author (75%; 15 articles), single author (10%; 2 articles), and main inventor (>50% inventorship of 2 granted patents). Being Italian, his activity includes productive stays in Spain, Taiwan, and a network of collaborators from USA, China, Germany, Spain, Taiwan, Iran, Hungary, Italy, Slovenia.

FP is PI of 1 research contract with the breeding company Enza Zaden. FP is PI of 2 grants (MiniVi, DeeVir) awarded under competitive calls by Cineca (Italy) and Spanish Supercomputing Network (Spain).

In 2010, FP began his career at NATIONAL CENTRE FOR BIOTECHNOLOGY (CNB, CSIC, Spain); at JA García's lab, his work on Potyviridae, showed that P1 proteinases coordinate viral replication and host defense activation dynamics (PLoS Pathog 2014;10(3):e1003985). During his postdoc stays at CNB (2015-2016) and Agricultural Biotechnology Research Center (TAIWAN, 2016-2020), FP pursued an independent synthetic biology research line for virus system engineering (ACS Synth Biol 2017;6(10):1962-1968; Plant Biotechnol J 2019;17(6):1010-1026; Biotechnol J 2021;16(5):e2000354). He discovered that abscisic acid regulates plant RNA metabolic homeostasis and antiviral immunity, mimicking the antiviral CRISPR/Cas dormancy (Plant Commun 2020;1(5):100099).

In 2021, FP joined INSTITUTE FOR PLANT MOLECULAR AND CELLULAR BIOLOGY (CSIC-UPV, Spain); with J.A. Daròs, he has contributed to advances for CRISPR/Cas editing using viral vectors (Mol Plant 2023;16(4):660-661; Biotechnol J 2022;17(7):e2100504; Hortic Res 2024;11(1): uhad279).

FP is leading an independent research aiming at establishing an evolutionary-informed blueprint for virome synthetic genomics and designing new strategies for crop protection (FEMS Microbiol Rev 2022;46(4):fuac011; Mol Plant Pathol 2022;23(10):1555-1564; Plant Signal Behav 2023;18(1):2214760; STAR Protoc 2022;3(4):101716).

Most of his career was self-funded through awards from international, competitive programs: in 2020, a 3-year "Juan de la Cierva" postdoctoral fellowship (Spain); in 2016, a 4-year postdoctoral fellowship (ACADEMIA SINICA, Taiwan); in 2010, a 4-year PhD scholarship (LA CAIXA FOUNDATION, Spain).

FP has co-supervised MSc students and an on-going PhD thesis. He is member of scientific societies, has contributed oral communications to international scientific congresses (UK, JAPAN, TAIWAN, KOREA, etc), is Editor of J Virol Methods, Front Bioeng Biotechnol, Front Virol, and served as

a reviewer for journals including Hortic Res, Mol Plant Pathol, Plant Cell Environ, Plant J, Plant Physiol. In 2020 and 2023, FP was a grant reviewer for research agencies (ANR, France; AEI, Spain).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | VÉLEZ VELÁZQUEZ, EMILIO JOSÉ |
| **Referencia:** | RYC2023-045487-I |
| **Correo Electrónico:** | evelezve@gmail.com |
| **Título:** | Understanding fish growth regulation to improve aquaculture production |

**Resumen de la Memoria:**

Since the start of my career, my research has been dedicated to understanding the regulation of fish growth with the ultimate goal of contributing to improving aquaculture production. My work has focused on decoding the endocrine GH/IGF-I axis regulation of somatic growth and deciphering the cellular mechanisms involved in the degradation of proteins (proteolysis and autophagy). The results of my research are reflected in 46 publications and 77 communications at national/international conferences. Publications: I am the first author for half of them (22), which reflects my hard work and commitment to the research, as well as my leadership, mobility, and internationalization, since the correspondence of those works is distributed among 6 researchers, including myself. The articles are distributed in 10 different JCR areas, highlighting the multidisciplinary aspects of my career. They have received so far 614 citations, reaching an h-index of 17. 66% of them have been published in Q1 journals, and I have pursued publishing my works as Open Access whenever possible. Communications: I am the first author of 33 works and I have personally presented 26 (65% at international conferences). I received the Best Talk prize for my presentation at MetaBoDay2023, and the Best Poster award in the XVICNA 2013.

Technical contributions: my work has been key for the development of the projects in which I am involved and the establishment of techniques and protocols in the host laboratories, as well as for my future research.

In addition to all the mentioned, my research results and trajectory have been featured in several press publications, including a recent interview in Le Monde. I have gathered 6 years of international experience and established a strong and extensive network of collaborators. As a result, half of my publications are co-authored with colleagues from other countries/regions, reflecting my high degree of internationalization and mobility. During my career, I have been involved in a large number of research projects (15 in total), but I also obtained my own funding to cover travel and living expenses, salary, and research-related expenses, or to attend conferences. So, from the start of my postdoctoral stage (end of 2018), I have assumed the main responsibility of conceiving the hypotheses and conceptualization, obtaining the main funding, and leading my projects. My independence and leadership skills are demonstrated by my ability to articulate disruptive but feasible hypotheses, allowing me to secure funding to implement research projects. Also, this is evidenced by the large number of projects in which I have participated, my predominant role as key author in over 50% of my publications, my mentoring and dissemination records, my solid network of collaborators, and my experience as editor and reviewer.

Research Line: It has been reported in mammals that a selective degradative pathway called eMI is associated with the secretion of proteins. Interestingly, the growth hormone of Mediterranean aquaculture fish exhibits the specific and necessary sequence to be targeted to the eMI process. Thus, eMI could be involved in rerouting GH to degradation or secretion, and eMI modulation has great potential to boost fish growth. So, I decided to start my research line aiming to explore the regulation of eMI and its contribution to fish growth.

**Resumen del Currículum Vitae:**

I have been trained as a comparative physiologist with a special emphasis on the cellular adaptation processes regulated, or mediated, by the metabolism of proteins and the endocrine system. I studied Biology and MSc in Integrative Physiology at the Univ. of Barcelona (UB), and I was awarded the Extraordinary MSc Award. Then, I earned a 14-months research fellowship to perform fish cell cultures with Dr. Gutiérrez (UB). Next, I got an FPI Fellowship to do the PhD in Aquaculture (UB) studying the endocrine regulation of fish growth. I realized two secondments abroad (USA and France, 4 months/each) and one short visit to a national lab (IATS, CSIC). I found that moderate and sustained swimming is a useful strategy for stimulating the GH/IGF axis and improving somatic growth in sea bream, being a very promising strategy to boost aquaculture production. I finished my PhD (2018), obtaining the Excellent cum laude and the Extraordinary PhD Award.

After PhD, I earned 2 PostDoc Competitive Canadian Fellowships to go to the Univ. of Saskatchewan (Canada). My main achievement was the discovery of a new role of nucleobindin-encoded peptides as negative growth regulators in mammals, and I received a Top-Up Award.

After 2 years I returned to Europe for a 2-years PostDoc contract to work at INRAE (France) in the chaperone-mediated autophagy (CMA) pathway and I earned an MSCA Individual Fellowship to extend the work to a total of 4 years. I have discovered that CMA is a key protective system against hyperglycaemic stress, generating a huge impact in the media.

Recently, I have been the first to collect evidence of the existence in fish of a novel autophagy pathway called endosomal microautophagy (eMI). eMI has been associated with both the degradation and secretion of proteins (hormones). Considering this, I have started developing my own research line devoted to studying the eMI regulation and its physiological role in the control of fish growth.

So far, I have built over a decade of experience as a researcher acquiring (i) Integrative knowledge, Technical skills, and Independency: The results of my research are reflected in 46 publications for which I am first author in 22, or the corresponding author (1). (ii) Mobility and internationalization: I have worked in different national (UB, IATS-CSIC) and international (France, Canada, USA) labs, and participated in multiple conferences, allowing me to establish a strong network of collaborators. (iii) Leadership and mentoring: I am co-supervising 1 PhD student (INRAE-UPPA, France) for which we have secured European funds, and 1 BSc student (UB). I have previously mentored other students and taught lessons on fish physiology and aquaculture to MSc and BSc students. (iv) Funding: I have obtained Regional, National, European (MSCA-IF), and International (Canadian SHRF and CIHR) funding for my research, and other mobility grants to carry out research/attending conferences. I have participated in European (3), National (3), and Regional (9) projects, and 2 Transference Research contracts. (v) Dissemination: I have collaborated in the organization of 2 conferences and widely disseminated my work to different audiences, including 77 communications in national/international meetings. I am Review Editor in Front Endocrinol, edited 3 different Topics, as well as reviewed for up to 17 different journals.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
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| **Referencia:** | RYC2023-044163-I |
| **Correo Electrónico:** | alaitz.etxabide@ehu.eus |
| **Título:** | Valorisation of macronutrients from food waste for a nutritious, personalized and sustainable diet |

**Resumen de la Memoria:**

My research is focused on the recovery of macronutrients (e.g. proteins and polysaccharides) from agri-food industry waste for food-related product development and, since 2021, I have been leading within the Biomat research group (UPV/EHU) the 3D printing valorised food research line, a field of research I opened over 2 years ago. In this research line, I also assess the environmental impact associated with the processes and products developed through life cycle analysis to establish the food-wellness-health-sustainability link since the reintroduction of food-waste-derived ingredients into the food chain can become a consistent strategy with the zero-waste circular economy.

My predoctoral stage (3.5 years) included 2 international stays at the University of Bordeaux (France, 4 months) and at Newcastle University (UK, 3 months), where I established the food science-technology-health link. Then, during my postdoctoral stage (7 years), I have conducted scientific stays at Auckland University of Technology (AUT, 10 months), the University of Auckland (UoA, 27 months) (both in New Zealand) and at the Universidade do Minho (UM, Portugal, 6 months) where I further developed my research skills and knowledge on macronutrients valorisation and their processing for food-related applications. As a result, I have established a solid international network in Europe and Oceania (e.g., UoA, AUT, LASRA, SCION, UM). It is worth noting my role as a leader from UPV/EHU of the project "Waste to Treasure: Using Novel Chemistry to Valorise Residual Plant Materials" funded by MBIE (5 M€, New Zealand) within the frame of the Endeavour Fund, as well as in 2 proposals in the frame of Horizon Europe Program (HORIZON-CL4-2024-TWIN-TRANSITION-01-01 and ReMade@ARI).

During my entire scientific activity, I have been independently funded at every stage of my career (6 grants/fellowships). As a result, I have yielded 47 peer-reviewed publications with over 2,700 citations (an h-index of 25) and partaken in 19 international conferences, 19 research projects (e.g., 2 projects of the National R+D+I Plan and 2 European Commission's Funding & tender opportunities), 9 transfer contracts with companies, 1 patent, 1 spin-off and 3 research awards. In addition, I have supervised internships and BSc/MSc/PhD students/candidates and have been actively involved in the peer-review process for scientific journals ranked in the top 10% of the Food Science and Technology area (e.g. Food Hydrocolloids).

When I returned to the Biomat group (UPV/EHU) in 2022 after 50-month research activities at foreign universities, I started leading the food research line within the group. Obtaining a Ramón y Cajal fellowship would allow me to open up new opportunities for the implementation of an emerging bio-based circular economy in the agri-food supply chain where I would combine all the knowledge of biopolymers and bioactives extractions, optimisation of formulation composition, selection and characterisation of bioactives and pharmaceuticals, cross-linking methods, bioactives release control, and materials manufacturing. Last but not least, this fellowship would give continuity and stability to my professional career, since I am a committed scientist and researcher.

**Resumen del Currículum Vitae:**

Current/previous positions:
Currently, I am a researcher at UPV/EHU, leading the food research line within the Biomat group. Previously, I carried out the following predoctoral and postdoctoral positions: Juan de la Cierva-Incorporación (2021-2023, UPV/EHU), Juan de la Cierva-Formación (2019-2020, UPNa), Erasmus Mundus Action 2 (2017-2018, AUT, New Zealand), PhD fellowship (2014-2017, UPV/EHU).

Academic education:
I completed a bachelor's degree in Chemical Engineering and a master's degree in the area of Renewable Materials Engineering. I am actively training through courses and seminars such as Basic Concepts of Food and Nutrition (Universitat Oberta de Catalunya-2023/24) and Skills for the Green Transition (Cambridge Judge Business School-2022).

Fellowship/awarded grants:
I have been independently funded at every stage of my scientific career. This includes: Juan de la Cierva-Incorporación, Juan de la Cierva-Formación, Erasmus Mundus Action 2 PANTHER in New Zeeland, and PhD fellowship.

International mobility:
I have conducted over 4 years of research at foreign universities located in Portugal, France, the UK and New Zealand: Universidade do Minho (Portugal, 6 months, 2023), University of Auckland (New Zealand, 27 months, 2020-2022), Auckland University of Technology (New Zealand, 10 months, 2017-2018), Newcastle University (UK, 3 months), Université de Bordeaux I, (France, 4 months, 2015).

Publications/other dissemination activities:
I am the author of 47 publications (23 as first author, 12 as corresponding author, and 20 are international collaborative works) in renowned journals in the field (e.g., Food Hydrocolloids, Green Chemistry). 87% of the papers are published in journals of the first quartile, and 51% in journals ranked in the top 10% of their areas. These works have been cited > 2,700 times (h-index of 25; Database - Scopus).
I have also disseminated my research findings via 19 international conferences (all with an external admission assessment committee), invited conferences/talks (e.g., Pint of Science), radio/TV programs, and educational talks in high schools.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Research projects/contracts/transfer merits:
Currently, I am the leader from UPV/EHU of the "Waste to Treasure: Using Novel Chemistry to Valorise Residual Plant Materials" project (MBIE, New Zealand) and of Horizon Europe Framework Programme proposals (HORIZON-CL4-2024-TWIN-TRANSITION-01-01; ReMade@ARI). I have also taken part in 9 transfer contracts with companies and I am the co-founder of the Proteinmat spin-off and co-inventor of a patent (2022, EP21382834.6).

Awards:
I was given the Extraordinary Doctoral Award (UPV/EHU, 2019), the Best Informational Article Award (CAF-Elhuyar, 2018) and the Young Researcher Prize for the best oral presentation (Carbohydrate Polymers Journal, 2016).

Obtained accreditations/recognitions:
I have obtained accreditations as Ayudante Doctor (2018) and Personal Investigador Doctor (2023), both by the Agency for Quality of the Basque University System (Unibasq).

Supervision of students:
I have supervised internship (1), BSc (2), MSc (3), and PhD (1) students.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | RODRÍGUEZ BARRETO, DEIENE |
| **Referencia:** | RYC2023-044728-I |
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| **Título:** | Aquaculture sustainability and animal welfare: physiological implications of aquaculture intensification (nutrition, epigenetics and more) |

## Resumen de la Memoria:

Sustainable aquaculture and animal welfare are a common thread along my career, with my research till date developed on fish management, nutrition and reproduction, fish environmental epigenetics, transcriptomics and fish microbiome research.

My current line of research "Early conditioning: mechanism underlying nutritional programming and its multigenerational inheritance" is a natural consequence of my career path, and has led to my position as group leader at ULL, with my research group consisting of 2 postdocs, 1 bioinformatician, 1 PhD and 1 technician. This line of research will provide novel mechanistic insights into the role of epigenetics and microbiome in nutritional programming, identifying novel epigenetic markers involved in tailoring metabolic pathways for better use of sustainable aquafeeds, and paving the way for advances in aquaculture research.

My PhD (2014), funded via an FPU research fellowship, was focused on fish nutrition and reproduction, specifically on assessing fatty acid requirements of greater amberjack (Seriola dumerili) broodstock. It resulted on 4 JCR papers, 8 conference contributions, 2 internships overseas, the co-supervision of 2 TFG, and led to my participation in DIVERSIFY (FP7).

I held a postdoctoral position at Swansea University (SU) (2015-2020), representing 5 years of international postdoctoral experience. I worked in two main research lines: the main one focused on aquaculture sustainability and animal welfare, applying high-throughput sequencing and molecular tools to improve our understanding of the environmental and physiological implications of aquaculture intensification, and the second one focused use and refinement of molecular tools based on eDNA to improve biomonitoring and accurate assessment of fish community assemblages in the wild. I started my position at SU to look for molecular markers of domestication in Atlantic salmon to assess introgression in wild populations, exploring the role of epigenetic modifications in farmed vs wild salmon, position that followed up with my research on epigenetic management of stress and disease resistance in Atlantic salmon, and the evaluation of the effects of aquaculture intensification on Nile Tilapia. Both entailed the use of novel genomic tools and bioinformatics, and imply me setting up and bringing new techniques to the lab (e.g. MBD-seq; RRBS), what lead to my involvement in AMBER (H2020) where I was in charge of the use and refinement of molecular tools based on eDNA to develop novel and ecological metrics of stream fragmentation.

In 2020, after 1 year of maternity leave, once AMBER was finished, I started a new postdoctoral position in ULL/ IEO-CSIC (2020-2021). My main research focus was to evaluate the effects of culture environment and early nutrition on microbial communities of common octopus and improving spawning control and in vitro fertilization in this species.

Between 2022 and 2023, I implemented a new scientific and technical service in the COC-IEO CSIC. In October 2023, after a period of inactivity (risky pregnancy and maternity leave), I started my current position as "Viera y Clavijo Senior" at ULL as PI of EPIAQUA (ERC-StG2022).I look forward to continue and expand my research on fish epigenetics and early conditioning, which I believe has the potential to deliver important benefits for aquaculture and animal welfare.

## Resumen del Currículum Vitae:

I am PI and coordinator of the ERC-StG2022 funded project EPIAQUA and the benificiary of a "Viera y Clavijo Senior" Posdoctoral fellowship, currently holding funds as PI for over 1.5 M € I have participated as a researcher in 11 national and international projects along my career (including 3 Plan Nacional I+D+I- MEC (Spain)), 2 funded by private entities (Fundación CajaCanarias), 2 BBSRC (UK), 1 NRN-LCEE (UK), 2 EU: DIVERSIFY (FP7) and AMBER (H2020), and 1 NextGeneration EU). It has resulted in the publication of 20 peer-reviewed articles, 1 book chapter, and over 20 national and international peer-reviewed conference contributions (13 international, 5 oral). 15 out of the 20 peer-reviewed articles are published in Q1 leading highly specialized journals or on high-impact broad-scope ones, 4 of them in the first decile, including one as 1st author in MBE (Q1; IF: 14.797), accumulating all of them 678 citations and an H index of 13 (Google Scholar) (11 signing as 1st, 2nd or corresponding author). Currently, 1 article as 1st and corresponding author is under review (AQUACULTURE-D-24-00238), and 2 in preparation. Invited as "plenary speaker" to the work-shop "Genomics in Aquaculture: a new set of tools to increase sustainable production of seafood" (Merida, Yucatan, México, 2017).

I am member of the editorial board of Frontiers in Marine Fisheries, Aquaculture and Living Resources as a Review Editor. I co-chaired the emerging species session of Aquaculture Europe Conference 2021. I have reviewed for several indexed JCR journals including Animals, Aquaculture, Scientific Reports, Molecular Biology Reports, Frontiers in Marine Sciences, General and Comparative Endocrinology and Lipids. I have a strong network of international collaborations, including leading groups in Aquaculture, fish behaviour, ecology and evolution, epigenetics, and developmental biology, such as my former lab (Sonia Consuegra and Carlos Garcia de Leaniz lab), Dr. Monica Betancor (Aquaculture Institute, Stirling-UK), Carlos M. Rodriguez Lopez's lab (UK-Kentucky ,USA) and Eve Seuntjens' Group (KU Leuven, Belgium).

I maintain fruitful collaborations with various industry partners (Fishgen, SPAROS).I got the Seal of Excellence H2020- MSCA-IF-2020.

Accredited as "Profesor Contratado Doctor" (ANECA). I have host and supervised international students stays and internships (8), assisted and provided technical support to PhD students and undergraduates, overseen and trained 2 PhD students, supervised 2 TFGs, 1TFM and 1 workplace training programme student (FCT),currently supervising 1FCT, 2TFGs, 1TFM, and 1 PhD. I have being a panel member in 6 TFM (2022 and 2023) and 2 PhD thesis committees (2023, one of them at NTNU, Norway).

Organization of R&D activities, workshop and seminars: Advances in Aquaculture (ULL)", "Métodos de trazabilidad de organismos acuáticos acuáticos y acuicultura (ULL)"), and more. Participation in numerous dissemination and outreach activities.

5 years Postdoctoral experience abroad (SU)

Short research Internships: Pre-doc: IBERS, UK (3 month-2010; 3 month 2012). Post-doc: CNSS (France).

**Área Temática:** Ciencias agrarias y agroalimentarias
**Nombre:** GUZMÁN PUYOL, SUSANA
**Referencia:** RYC2023-042483-I
**Correo Electrónico:** susanagpuyol@gmail.com
**Título:** Upcycling of cellulose and lipid-rich by-products for the production of food packaging materials

**Resumen de la Memoria:**

I am a chemist specialized in the production of multifunctional bioplastics from agro-food wastes for food packaging uses. During my research career, I have carried out a multidisciplinary research, being the main goal the upcycling of wastes and by-products of the agro-food industry and the production of food packaging materials in a "circular economy" approach. Since the beginning of my career, I have published 41 ISI papers (68% Q1, 49% D1) and 1 book chapter. I have worked with over 100 researchers from more than 30 institutions. Some metrics of interest (Scopus, 27/01/2024):
- Total articles/last 5 years: 41/28
- Q1 articles/last 5 years: 28/21
- D1 articles/last 5 years: 20/15
- Total citations: 1099

My research career started with a PhD fellowship at the Università degli studi di Genova, working in the fabrication of a new class of biodegradable materials from cellulose and cellulose-rich agro-food wastes. After, I started my postdoctoral period at the Istituto Italiano di Tecnologia as a postdoc in two research projects for the bioplastic industry related to the fabrication of novel polyhydroxyalkanoates composites. As a whole, this period constitutes 75 months in foreign institutions and my involvement in 2 contracts with foreign industrial companies. In 2019, I returned to the Universidad de Málaga, where I spent some months working in the development of cuticle-inspired materials for food protection. Since 2020, I continued my research in the Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora". Since March 2022, I am recipient of a competitive 3-years postdoctoral contract for access to the Spanish Science, Technology and Innovation System by Junta de Andalucía. During this period, I have continued with my main research line about cellulose-based food packaging films at the same time as I started to work in a new research line about the exploitation of subtropical agro-food wastes and their conversion to multifunctional, biodegradable food packaging bioplastics. Furthermore, I currently participate in other projects related to the upcycling of tomato pomace and industrial potato peels for the fabrication of sustainable metal food packaging. In 2023, I was awarded with the Polymers 2023 Travel Award and by the American Society for Biochemistry and Molecular Biology to spend a period in selected U.S. laboratories. In my case, I was visiting the Professor Stark's lab to learn about the characterization of solid samples by NMR. As a summary, I have secured over 290.000 € as individual research funding, PhD and postdoctoral fellowships, and international awards.

On the other hand, through the different stages of my research career, I have participated in 6 projects with public funding and 3 private contracts, exceeding 885.000 € in total. Moreover, I have been the PI of a contract with the company Ayuda en Acción about the development of fully biodegradable food packaging from cocoa wastes from Ecuador. Finally, I am the Principal Scientific Investigator of the project Estrategia de Innovación Científica de Bioeconomía Circular por el IHSM-CSIC-UMA. During the development of this project we will analyze different cocoa cultivars from Honduras to select the best varieties for the fabrication of food packaging. One of the work packages includes the transfer of the know-how to local women.

**Resumen del Currículum Vitae:**

I am a chemist specialized in the production of multifunctional bioplastics from agro-food wastes for food packaging uses. I studied Chemistry in the Universidad de Málaga. In January 2013, I granted a PhD fellowship from the Università degli studi di Genova. During that period, I was mainly involved in the fabrication of new materials from cellulose and cellulose-rich agro-food wastes. In May 2017, I started my postdoctoral period at the Istituto Italiano di Tecnologia as a postdoc in two research projects for the bioplastic industry. In 2019, I continued my career in the Universidad de Málaga and, in 2020, I moved to the Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora". Since March 2022, I am recipient of a competitive 3-years postdoctoral contract for access to the Spanish Science, Technology and Innovation System by Junta de Andalucía.

During my research career, I have carried out a multidisciplinary research for the fabrication of sustainable bioplastics for food packaging. The goal has been to upcycle the wastes and by-products of the food industry and produce sustainable food packaging materials in a "circular economy" approach. Since the beginning of my career, I have reached a proven record of accomplishments, with 41 ISI papers (68% Q1, 49% D1) and 1 book chapter. In addition, I have contributed with 17 oral presentations in international conferences, being invited speaker in 3 of them and organizer of the Symposium "Circular approach to bio-based materials" of the Materials Science and Engineering Congress, Darmstadt (Germany), September 2022. Moreover, I joined two Cost Actions: CA18210 (Oxygen sensing a novel mean for biology and technology of fruit quality) and CA19124 (Rethinking Packaging for Circular and Sustainable Food Supply Chains of the Future). I am also full member of the European Polysaccharide Network of Excellence. In September 2020, I spent one month as an Invited Researcher at the Royal Institute of Technology (KTH, Stockholm, Sweden) and in 2023, I was awarded with the Polymers 2023 Travel Award and by the American Society for Biochemistry and Molecular Biology to visit the Professor Stark's lab. I have also been reviewer for high-impact scientific international journals such as Cellulose, Carbohydrate Polymers, and Foods, among others, and Guest Editor of the Special Issue "Preserving Food and the Planet: Sustainable Packaging for a Circular Food Economy" in the journal Future Foods. I have participated as an external expert for the evaluation of scientific divulgation projects managed by FECYT and, in 2018, I contributed to the initiative Ciencia en el Parlamento. In 2021, I was reviewer for the Organización de Estados Iberoamericanos. Furthermore, I have taken part of PhD Thesis Committees from Universidad de Sevilla and Università degli Studi della Basilicata and Master's Thesis committees in the UMA. During the different steps of my career, I have participated in many outreach activities such as demos and experiments in schools and talks for the general public. To date, I have codirected 2 Master's Thesis and currently I am co-director of a PhD student and a Bachelor's Thesis student, and supervisor of a visitor PhD student and a technician. Finally, it is outstanding my teaching labor in the Master's Degree Biotecnología Avanzada.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | MATENCIO DURÁN, ADRIÁN |
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| **Correo Electrónico:** | adrian.matencio@um.es |
| **Título:** | Gout Management through Molecular Encapsulation: A Breakthrough in Cyclodextrin with Bioactive Compound Research |

**Resumen de la Memoria:**

Tras obtener mi doctorado en 2020 gracias a un contrato competitivo FPU-UM, he centrado mis esfuerzos en contribuir al campo científico. Con 52 publicaciones, tres capítulos de libros y una patente solicitada, mi índice h es de 19, con 938 citas en SCOPUS hasta la fecha.

Comencé mi carrera de investigación como estudiante interno del Grupo de Excelencia "Bioquímica y Biotecnología Enzimática" de la Universidad de Murcia (UMU). Durante estos años, aprendí las bases de la enzimología y la encapsulación molecular. A lo largo de mi doctorado, exploré nuevas aplicaciones para la encapsulación de ciclodextrinas (CDs) en combinación con compuestos bioactivos.

Mi tesis se centró en el estudio de complejos de inclusión entre CDs y ligandos, utilizando técnicas como NMR y DSC. Exploré la aplicabilidad de estos complejos en química analítica, farmacia y ciencia alimentaria. Destaco mi contribución a la estabilización de oxyresveratrol en modelos alimentarios. Durante mi doctorado, colaboré con la Universidad de Turín, ampliando mis conocimientos en la síntesis de polímeros a base de CDs y aplicándolos.

Obtuve una beca de la Fundación Séneca para continuar mi carrera postdoctoral en Turin, investigando el uso de CDs como tratamiento para la enfermedad de Gota. Este proyecto, que concebí desde el principio, resultó en la presentación de una patente en Italia. Este trabajo representa un hito en mi carrera, demostrando la eficacia de las CDs en enfermedades no relacionadas con el metabolismo del colesterol.

Mi integración en el grupo de la Universidad de Turín marcó un cambio significativo. Desarrollamos proyectos para comercializar los polímeros basados en CDs en aplicaciones farmacéuticas y alimentarias. Investigamos la entrega de péptidos y la efectividad de los polímeros en aplicaciones alimentarias, como la entrega de Nisina y la mejora de la bioaccesibilidad de nutracéuticos.

Desde febrero de 2022, soy miembro de UNITO con un contrato RTDA (profesor asistente), centrado en investigaciones ambientales y la aplicación de polímeros de para Roquette Italy SRL.

Colaboro activamente con diversos grupos de investigación en Italia, Francia, Portugal, Irán, Turquía, Polonia, Hungría, Argentina, Japón y España, como se detalla en la sección 3. Además, participé en la colaboración con ACOLAT para generar alimentos lácteos enriquecidos con omega-3 utilizando CDs.

Destaco mi elección reciente como Soporte Científico y Técnico de la Autoridad Europea de Seguridad Alimentaria (EFSA), así como mi papel como evaluador internacional en proyectos polacos y la fundación ítalo-francesa VINCI.

Mi compromiso con la divulgación científica es evidente a lo largo de mi carrera. He participado en charlas, eventos y proyectos de divulgación desde mi etapa universitaria hasta mi papel actual como responsable de redes sociales en el departamento de UNITO. Además, he escrito artículos de divulgación en inglés, español e italiano.

En el ámbito asociativo, fui miembro fundador de BiotecMur, presidente de AJIUM y secretario de ADCMurcia. Actualmente, soy miembro activo de SEBBM, FEBIOTEC, SCI, AIM y CDTEC.

Estos pasos en mi carrera me han proporcionado habilidades de liderazgo, trabajo en equipo y resolución de conflictos, convirtiéndome en un candidato sólido para una beca "Ramón y Cajal".

**Resumen del Currículum Vitae:**

Soy un joven investigador con una sólida trayectoria en el campo de la encapsulación molecular, la caracterización y aplicación de compuestos bioactivos, combinando la enzimología, el acoplamiento molecular, la síntesis de nuevos biomateriales y el desarrollo de alimentos y formulaciones funcionales. Mi historial de publicaciones incluye 51 artículos de investigación revisados por pares, con más del 81% en el primer cuartil y un índice h de 19, respaldado por 934 citas en SCOPUS hasta la fecha (17/01/2024). Destaco como autor principal en el 47% y autor correspondiente en el 32% de estos trabajos.

En el ámbito de la financiación, he obtenido recientemente fondos como investigador principal en una convocatoria italiana y participo en un proyecto de investigación croata como colaborador. A lo largo de mi carrera, he asegurado financiamiento competitivo externo en cada etapa, desde mi doctorado hasta proyectos postdoctorales. He liderado cinco proyectos financiados en convocatorias nacionales y colaborado en dos asociaciones público-privadas.

Mi relevancia científica se evidencia en mi contribución al avance del campo, como se refleja en mi reciente publicación en la revista Trends in Food Science and Technology (IF: 12,563), donde consolidé los resultados de mi tesis doctoral y de otros autores sobre las aplicaciones de ciclodextrinas en ciencia alimentaria. Además, mi reconocimiento como Soporte Científico y Técnico de la Autoridad Europea de Seguridad Alimentaria y mi designación como "chair" en la Conferencia Europea sobre Ciclodextrinas en 2023 respaldan mi impacto en el ámbito internacional.

En términos de liderazgo, he asumido roles destacados desde mi periodo postdoctoral, siendo autor correspondiente o último en 18 artículos en los últimos 3 años. Además, he supervisado a dos estudiantes de doctorado, participando activamente en la formulación de hipótesis que han dado lugar a líneas de investigación fructíferas. Mis habilidades se extienden a la docencia, donde co-dirijo un curso en un máster participo como profesor en otros dos cursos en UNITO. He llevado a cabo proyectos de innovación docente y he dirigido estudiantes de grado, máster y doctorado.

En el ámbito de la transferencia tecnológica, he colaborado con empresas privadas como Roquette, Rejuvenate Biotec y otras, y soy miembro de grupos de transferencia tecnológica en instituciones académicas. Mi compromiso con la divulgación científica se refleja en trabajos en plataformas como Mapping Ignorance y organización de eventos como Researchers' Night y Pint of Science.

Como miembro activo de diversas asociaciones científicas en España, Italia y a nivel internacional, así como fundador de la "Asociación de Biotecnólogos de Murcia", demuestro un compromiso continuo con la comunidad científica.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | SHESTAKOVA , TATIANA |
| **Referencia:** | RYC2023-043363-I |
| **Correo Electrónico:** | tatiana.shestakova@udl.cat |
| **Título:** | Applicability of downscaled satellite-based soil moisture products for forest ecosystem monitoring |

**Resumen de la Memoria:**

During my PhD at the University of Barcelona (2012–16), I pioneered research on the geography of spatial synchrony in forest functioning by studying tree growth and physiological traits over broad spatio-temporal scales. Among other things, I identified (i) shifts in growth synchrony as an early warning signal of forest ecosystems increasingly threatened by climate warming, (ii) the differential coupling between tree growth and $\Delta 13C$-based water use efficiency trends in recent decades in Mediterranean altitudinal transects, indicating an upward spread of drought stress, or (iii) the loss of synchrony of cold-limited forests due to rising temperatures at latitudes above 60°N in Siberia. More recently, as part of my postdoctoral work at the Woodwell Climate Research Center (USA; 2019–22), I have developed a powerful tool to assess and monitor forest health by evaluating their stability over time —a fundamental part of ecosystem integrity —which is being compromised globally by climate and land-use changes. I have also worked with end users of my research, including a policy brief on boreal forests for the International Union for Conservation of Nature (IUCN).

I currently hold a Beatriu de Pinòs fellowship (Ref. 2020 BP 00126; 2022–25), which aims to bridge dendrochronological and state-of-the-art remote sensing approaches by investigating the role of soil moisture in driving ecosystem carbon acquisition across environmental gradients at intra- and inter-annual scales. To this end, I team up with researchers at the Barcelona Expert Center (CSIC–UPC). Throughout my career, I have established a multidisciplinary international network of collaborators and co-authors from the five continents and have participated in research projects in Russia, Spain, Australia and the Netherlands. I have led an international field expedition to Western Siberia to characterise the performance of boreal forests threatened by wildfires (2019) and I am co-PI of a research project funded by the MCIN (Ref. PID2022-139558OB-I00; 2023–26), which investigates the impact of climatic and anthropogenic factors on the relationships between tree growth dynamics and fungal diversity and productivity in Mediterranean forests. In addition to my research activities, I am strongly committed to Open Access and FAIR principles, being the main developer or co-developer of software packages available on CRAN that have been downloaded hundreds of times each ('smosr' and 'Dendrosync').

In my research, I propose to comprehensively assess the cascading effects of soil moisture (SM) changes on forest ecosystems using downscaled satellite-based SM products. I aim to evaluate how SM affects not only radial growth, productivity and physiological performance of trees, but also tree reproductive dynamics, fungal ecology and production, and forest live fuel moisture content. The main expected impact of this research is to demonstrate the hidden potential of remotely sensed SM estimates in forest monitoring and research. In this way, I anticipate to contribute to the dissemination of the use of satellite-based SM products as an alternative environmental variable that may be worthy of inclusion in many types of forest studies. Initially, I intend to focus my research on Spanish forests, but my network of international contacts may provide new and exciting opportunities in this direction.

**Resumen del Currículum Vitae:**

I graduated as an engineer (2008) and completed a MSc degree at the Siberian Federal University (SibFU; 2010). While enrolled in a PhD programme at the Sukachev Institute of Forest (2010–11) and SibFU (2011–12), I did an internship at the NASA Goddard Space Flight Center (USA). Subsequently, I was awarded a PhD scholarship ERANET–MUNDUS (Euro–Russian Academic Network, European Commission) at the University of Barcelona (2012–16) and obtained a PhD in Ecology with European Mention. During my PhD, I aimed to elucidate tree responses to global warming and, in particular, to characterise commonalities in forest growth and physiology across broad spatio-temporal scales. To this end, I developed a novel approach to statistical modelling of tree-ring networks (ring width, isotopes) to quantify temporal signals shared by forest stands at different scales. This opened up new avenues of research and allowed me to lead advances in the field of spatial synchrony in dendroecology. My leadership in this research area at the interface of forest ecology, biogeography and climate change was highlighted in the Featured Researchers published by Journal of Biogeography (2021). The autonomy and independent thinking allowed me to be recruited as a postdoctoral fellow (2019–22) by the Woodwell Climate Research Center (USA). I contributed to assessing the impacts of land use, wildfire and other disturbances on the spatial distribution, carbon cycling and ecosystem services of primary forests, and to developing policy recommendations for relevant arenas. I also developed an approach to monitoring ecosystem stability by combining field observations, remote sensing and ancillary geospatial information. Then, I was awarded a highly competitive Beatriu de Pinós fellowship to join the University of Lleida (2022–25), where I am applying my own line of research focusing on the role of soil moisture in driving ecosystem dynamics through remote sensing products combined with ground truth data across environmental gradients.

I have published 32 JCR articles and one book chapter with many international co-authors. Most publications are in high impact peer-reviewed journals (10 articles in D1 plus 13 articles in Q1 in their respective fields), and I have published 13 articles as first, last and/or corresponding author. I have participated in a number of research projects supported by European, Russian and Australian agencies and have established a multidisciplinary international network of collaborators across the five continents. I have served as PI of an EU-funded international expedition to Western Siberia (2019) and have been awarded a MICIN "Generación de Conocimiento" project as co-PI. I actively mentor students at BSc and MSc level, contribute to teaching activities in undergraduate and MSc programmes, and participate in synergistic activities (committee member and session convener of an international conference, guest co-editor of a Q1 journal special issue, 2-year term in the Editorial Academy at Journal of Biogeography, peer reviewer for top journals, research project evaluator).

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | CONTRERAS ROJO, MARINELA |
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| **Correo Electrónico:** | marinelacr@hotmail.com |
| **Título:** | Biotecnología aplicada al control y diagnóstico de vectores y las enfermedades que transmiten |

**Resumen de la Memoria:**

Soy Bióloga, doctorada en 2017 en el programa de Ciencias Agrarias y Ambientales en la UCLM. Mi tesis doctoral centrada en interacciones garrapata-hospedador-patógeno y desarrollo de vacunas me formó en la identificación y caracterización de numerosos antígenos candidatos de garrapata.

En los inicios de mi etapa postdoctoral, realicé estudios de control de micobacteriosis, desarrollando un nuevo modelo en pez cebra. Mi actividad investigadora estuvo muy ligada a colaboraciones con empresas, donde fui inventora en 2 vacunas patentadas, y a realizar estancias internacionales para formarme en tecnologías "omicas" y en el diseño de ensayos de vacunación.

Conseguí una ayuda Juan de la Cierva de Formación 2018 en el grupo del Prof. Cerón en la Universidad de Murcia (UMU) donde me centré en el estudio de biomarcadores séricos relacionándolos con respuesta inmune, permitiéndome conocer cómo afecta la vacunación con antígenos de garrapata en el hospedador, además, en esta etapa me formé en el diseño de inmunoensayos para diagnóstico de enfermedades infecciosas.

En mi etapa postdoctoral más actual mis máximas contribuciones han estado enmarcadas en un proyecto vigente con el Gobierno de Uganda, donde he estudiado medidas de control de garrapatas comunes del país, centrando mi liderazgo en el desarrollo biotecnológico y la producción de una vacuna que será patentada en dicho país. Otro proyecto que relaciona la biología de sistemas con la vacunómica, donde también contribuyo como co-investigadora principal, ha dado lugar a una patente para el control del Anaplasma phagocytophilum donde soy primera inventora y diferentes contratos con empresa que me han permitido aplicar nuevas estrategias en el desarrollo de vacunas en fauna doméstica y silvestre.

Actualmente me encuentro disfrutando del último año de la ayuda Juan de la Cierva de Incorporación, y mi línea de investigación se centra en el desarrollo y caracterización de una nueva aproximación, la vacunómica cuántica, para el diseño de vacunas frente a garrapatas, otros vectores y los patógenos que transmiten. Además, he aplicado las tecnologías en las que me he formado a lo largo de mi trayectoria, para poner en marcha una nueva línea financiada por un proyecto regional donde soy IP, centrada en la búsqueda de epítopos reactivos en proteínas de patógenos transmitidos por garrapata como Borrelia burgdorferi pudiendo eliminar reacciones cruzadas y aumentar la especificidad de inmunoensayos, con la colaboración de investigadores de la Universidad Gdansk (Polonia). Las técnicas aprendidas en la UMU han permitido también incluir en mi línea de investigación el estudio de los biomarcadores séricos que puedan ayudar al diagnóstico de patógenos transmitidos con garrapata en fauna silvestre y a asociarlos a sintomatología. La nueva colaboración con el Centro de Investigación en Biodiversidad y Recursos Genéticos (CIBIO-U.Porto) en mi última estancia postdoctoral, me ha permitido profundizar en el análisis de transcriptómica y conocer que procesos biológicos pueden determinar que una vacuna sea eficaz y ampliar así mis líneas.

En general, toda esta investigación ha llevado a la publicación de un total de 66 artículos SCI, 7 capítulos de libro y 16 comunicaciones en congresos, participar como inventora en 3 patentes, dos de ellas con empresas privadas, dirigir 3 tesis (2 en curso) y obtener el certificado R3

**Resumen del Currículum Vitae:**

Soy licenciada en Biología (UCM) y realice mi tesis en el IREC, sobre la identificación de antígenos protectores para el desarrollo de vacunas de nueva generación contra garrapatas. En ese periodo, realicé una estancia en la Freie Universität Berlin.

En mi etapa postdoctoral, participé en estudios de control de micobacteriosis; realicé estancias en el Instituto de Higiene y Medicina Tropical (Lisboa), aprendiendo proteómica de la interacción garrapata-patógeno, en NARO (Uganda) para el desarrollo de un proyecto internacional y trabajé en el grupo del Prof. Cerón (Universidad de Murcia) durante 2 años, financiado por una ayuda Juan de la Cierva de Formación.

Cuando me incorporé al IREC en 2022, como investigadora Juan de la Cierva de Incorporación (JdCI), establecí un Laboratorio de Biotecnología Avanzada. Como responsable de este laboratorio, mi liderazgo se centró en el desarrollo de una nueva aproximación para el desarrollo de vacunas frente a garrapatas. Actualmente desarrollo mapeo de epítopos para el diagnóstico de Borrelia burgdorferi en colaboración con la Dra. Lucyna Holec (Universidad de Gdanks, Polonia), donde he liderado un estudio reciente. Además, soy inventora de un antígeno quimérico patentado protector frente a Anaplasma phagocytophilum, que cuenta con una publicación.

Actualmente, me encuentro en el Centro de Biodiversidad y Recursos Genéticos (Portugal), financiado por una beca José Castillejo para la identificación de biomarcadores de eficacia vacunal en diferentes hospedadores y ampliar mi línea de investigación.

Como resultado de mi actividad investigadora, he participado en 66 artículos revisados por pares en revistas JCR, 24 como primera autora, 6 como última autora, 9 como autora en correspondencia. Más del 70% son colaboraciones internacionales. 7 capítulos de libros y 16 comunicaciones en congresos. Según Scopus, mi índice h es 21 y acumulando 1012 citas.

He participado en 2 proyectos financiados por la UE, 1 Internacional, 5 Nacionales y 2 Regionales, 3 contratos con empresas internacionales, en 2 de ellos, soy inventora de 2 patentes para el desarrollo de vacunas para el control del piojo de salmón (Zoetis) y garrapatas en animales de compañía (Beaphar).

Como JdCI, soy Investigadora Principal (IP) de un proyecto regional (JCCM) de mapeo de epítopos para el diagnóstico de B. burgdorferi, Co-IP en 2 proyectos y 2 contratos: un proyecto internacional financiado por el Gobierno de Uganda en el desarrollo de vacunas contra garrapatas en ganado bovino donde he co-dirigido de una tesis doctoral; en un Proyecto Intramural para Jóvenes Investigadores, estudiando la relación de la vacunómica con la Biología de Sistemas y en dos contratos con empresas privadas para desarrollar un probiótico y un inmunoestimulante. También codirijo dos tesis; una en colaboración con la Universidad de Córdoba y otra con el grupo de biotecnología reproductiva del IREC.

Participo regularmente en actividades de divulgación y difusión científica y he desarrollado habilidades editoriales como editora invitada en la revista Vaccines, como editora de revisión en Frontiers y revisora en 7 revistas del JCR. Miembro de tribunales de tesis y TFM.

He impartido docencia en la UCLM y cuento con las acreditaciones (ANECA) de Prof. Ayudante Doctor, Prof. Contratado doctor y Prof. de Universidad privada.

Recientemente he obtenido el certificado R3.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | SOUTO PEREIRA, SANDRA |
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| **Título:** | Prevention of viral pathologies in aquaculture |

**Resumen de la Memoria:**

El sector de la acuicultura enfrenta desafíos significativos debido a la aparición de enfermedades infecciosas. Las condiciones de cultivo intensivo aumentan la susceptibilidad de los peces a patologías, siendo las de origen vírico las más amenazadoras. Estas enfermedades destacan por su capacidad para inducir elevadas tasas de mortalidad, generar infecciones persistentes y carecer de tratamientos eficaces. En particular, los brotes de encefalopatía y retinopatía viral (VER) en peces representan una seria amenaza en el sur de Europa, ocasionando significativas pérdidas económicas. La VER afecta principalmente a las fases larvaria y juvenil, con consecuencias devastadoras en la producción. Esta enfermedad es causada por el virus de la necrosis nerviosa (VNNV), perteneciente al género Betanodavirus y a la familia Nodaviridae. Estos virus, pequeños y sin envoltura, poseen un genoma monocatenario compuesto por dos moléculas de ARN: ARN1 (codificante de la polimerasa viral) y ARN2 (codificante de la proteína de la cápside, CP, de aproximadamente 37-42 kDa). Los aislados de NNV se clasifican en cuatro genotipos: RGNNV, SJNNV, BFNNV y TPNNV. En el sur de Europa, se han identificado recombinantes naturales entre RGNNV y SJNNV, portando una CP de tipo SJNNV, causando brotes en lenguado y dorada. Dada la falta de tratamientos eficaces, la vacunación es decisiva en la prevención y control de la VER en acuicultura. Sin embargo, en Europa, solo dos vacunas basadas en una cepa RGNNV inactivada están disponibles, limitándose su uso a lubinas juveniles con peso superior a 10 g. Dada la persistencia de la infección por cepas de tipo RGNNV en la cría de lubina y la presencia de recombinantes con CP de tipo SJNNV en otras especies cercanas, se plantea la necesidad desarrollar nuevos métodos de prevención. La investigación de la Dra. Souto se basa en desarrollar vacunas multivalentes y métodos de administración destinados a la inmunización de peces de estados iniciales de desarrollo y a gran escala para proteger especies valiosas de acuicultura frente a infecciones por VNNV. Tiene especial interés por los mecanismos moleculares de regulación de este virus y por la interacción virus-huésped. El objetivo final de su línea de investigación es contribuir a la prevención de VER en acuicultura mediante la implementación de un programa de vacunación para la protección del lenguado y lubina frente a la infección de los diferentes genotipos de VNNV.

**Resumen del Currículum Vitae:**

Sandra Souto se licenció en 2007 en Biología por la Universidad de Santiago de Compostela, y partir de ese momento se incorporó al grupo de Virología de peces del Instituto de Acuicultura de la misma universidad. Su carrera investigadora se ha centrado en la prevención y control de las principales patologías de origen viral en especies acuáticas con importancia para la acuicultura. Durante su tesis doctoral, defendida en 2015, estudió los mecanismos de patogenicidad y virulencia del virus de la necrosis nerviosa viral (VNNV) para dos de las especies más importantes de cultivo en Galicia: el lenguado y el rodaballo dando lugar a cuatro publicaciones científicas. Durante esta etapa realizó una estancia en el centro francés INRA donde desarrolló un sistema de genética reversa que permite la recuperación de virus recombinantes, que ha empleado para producir un gran número de VNNV recombinantes para la búsqueda de factores de virulencia y patogénesis. En el 2015 presenté su tesis doctoral con mención Internacional y cualificación cum laude, y recibio el Premio extraordinario de doctorado. En 2016, inició sus estudios posdoctorales y obtuvo su primer contrato posdoctoral para el desarrollo de vacunas atenuadas para la protección de lenguado frente a la infección de virus VNNV. En el 2018 a través de un contrato de formación posdoctoral (Xunta de Galicia) realizó una estancia de dos años y medio en centro francés Instituto Nacional de Investigación para la agricultura, Alimentos y medioambiente (INRAE) donde llevó a cabo un proyecto para el diseño de vacunas vivas atenuadas bivalentes basadas en el virus de la septicemia hemorrágica viral (VSHV). Paralelamente, colaboró en el desarrollo de un sistema de genética reversa para el virus primaveral de la carpa (VPC) que ha dado lugar a una patente. Posteriormente se incorporó a la Universidad de Santiago de Compostela, dentro del Departamento de microbiología y parasitología. En la actualidad, como beneficiaria de un contrato de consolidación de estudios de posdoctorado (Xunta de Galicia) lidera su propio proyecto para la puesta a punto punto de la tecnología del RNA mensajero para vacunas en acuicultura empleando como modelo el virus NNV. Además, forma parte del equipo de trabajo de un proyecto europeo (Cure4Aqua) para el diseño de vacunas que puedan ser utilizadas en acuicultura para protección frente a infección por VNNV a través de distintos enfoques. Además, como miembro del departamento de Microbiología y Parasitología de la Universidade de Santiago de Compostela imparte docencia en asignaturas de los grados de biología, biotecnología, farmacia, óptica y medicina y supervisa trabajos de fin de grado y máster. A lo largo de sus etapas predoctorales y posdoctorales ha sido autora de 24 publicaciones en revistas indexadas, ha participado activamente en 19 proyectos de investigación, incluyendo dos proyectos internacionales, estudiando los factores moleculares de virulencia de virus acuícolas y desarrollando herramientas diagnósticas y vacunas para el control de enfermedades virales en acuicultura y presentado un total de 39 comunicaciones en congresos y reuniones científicas tanto nacionales como internacionales.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | ESTEBAN TORRES, MARÍA DEL MAR |
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| **Título:** | Microbiota-host interactions in early life |

**Resumen de la Memoria:**

During my PhD (2009-2014) funded by a JAE predoctoral grant at ICTAN-CSIC supervised by Prof. Rosario Muñoz and Dr. Blanca de las Rivas, I contributed substantially to advancing the field of diet metabolism by gut commensal bacteria. I discovered novel key enzyme in the gut bacterium Lactiplantibacillus plantarum conferring it advantages to survive on plant and gut environments (Research line 1). Then, I carried out my postdoctoral research in the lab of Prof. Douwe van Sinderen, at the APC Microbiome Ireland, focusing on the study of bifidobacteria, a key gut commensal used as probiotic (Research line 2). I applied metagenomics, metabolomics, molecular biology techniques and animal models to identify the molecular players involved in host-bifidobacteria interactions. I was awarded a prestigious postdoctoral fellowship funded by the Irish Research Council to study the carbohydrates metabolism in bifidobacteria to decipher how diet influences the activity of bifidobacteria to exert their probiotic effect. I described the importance of the bifidobacterial intracellular accumulation of in gut colonization and persistence. Additionally, I developed novel molecular tools to analyse host-bifidobacteria interactions. These vectors were successfully applied to identify a new immunomodulatory role for B. breve exopolysaccharide and for its systemic dissemination (a manuscript published in Frontiers in Microbiology 2021, and a manuscript in preparation). In 2020, I secured a competitive career development Marie-Curie Individual Fellowship (score 100/100) 'MicroMI' aiming to study the transfer of gut microbiota from mothers to babies and the impact in infant health (Research line 3). For this project I am applying state-of-the-art sequencing technologies, culturomics, animal studies and cell cultures at IATA-CSIC, Valencia (SPAIN) in the lab of Prof. Maria Carmen Collado. This exciting project has discovered the key role of Bifidobacterium in the vertical transmission. Furthermore, several strains vertically transferred have been already isolated and characterized. They showed the ability to grow on human milk oligosaccharides as well as new interesting immunomodulatory activities. This discovery has led a collaboration with an industry partner (ADM, Spain) to further characterize the potential probiotic traits of those strains to develop next-generation of probiotics based products.

**Resumen del Currículum Vitae:**

I am a Microbiologist with a multidisciplinary background in microbiota-host interactions. I have published 29 research articles (13 as first author) with a H-index of 19 and a total of more than 1000 citations (Google Scholar). I have participated in 14 national and international projects, 2 of them as PI and 2 with industry partners (DANONE and Abbye). During my PhD (2009-2014) at ICTAN-CSIC I contributed substantially to advancing the field of diet metabolism by gut commensal bacteria, unrevealing key enzymes of the gut bacterium Lactiplantibacillus plantarum involved in food phenolic compound transformation. My PhD produced more than 20 articles, 11 as first author. I carried out my postdoctoral research at APC Microbiome Ireland, focusing on the study of bifidobacteria-host interaction. I was awarded a prestigious postdoctoral fellowship funded by the Irish Research Council to study the carbohydrates metabolism in bifidobacteria. During my postdoctoral stay I applied new molecular tools to identify yet undescribed immunomodulatory role of (a paper published in Frontiers in Microbiology 2021 and a manuscript in preparation). In 2020, I secured a competitive career development Marie-Curie Individual Fellowship (score 100/100) 'MicroMI' aiming to study the transfer of gut microbiota from mothers to babies and the impact in infant health. This exciting project has discovered the key role of Bifidobacterium in the vertical transmission and it has led the collaboration with an industry partner (ADM, Spain). Over the course of my postdoctoral research, I have participated in 5 publications, 2 book chapters and 1 e-book (as co-editor). I have 2 reviews submitted to Gut Microbes and 4 articles in preparation. I have been head editor of a research topic with highly cited researchers such as Prof. Douwe van Sinderen, Prof. Marco Ventura (Italy), and Prof. Abelardo Margolles (Spain). I have 21 contributions to international conferences and I was awarded a travel grant Microbiology society (UK) for participating in IHMC 2021 conference. I have been invited at 2 international conferences (Human Microbiome Symposium, Norway, 2022 and International Conference on Microbial Research and Applications, USA, 2019) for an oral communication. I have participated in 7 international projects, 1 of them is ongoing: "Infant Gut Microbiome Acquisition: Off to a Healthy Start", funded by the Norwegian Center for Advanced Study, Norway. I have been PhD tribunal member ("vocal") in 1 PhD thesis dissertation and external evaluator of 1 national PhD thesis.

I am committed to training and developing the next generation of excellent researchers. Therefore, through my career I have been supervisor of 1 visitor postdoc, 2 visitor PhD students and 2 Master¿s students who have followed research pathways at APC Microbiome Ireland. One of the Master students won the prize for the best poster at APC Microbiome Symposium 2017. I have been honored to serve as lab mentor and advisor for students (undergraduate and masters) and postdocs. I have secured funding for 5 APC summer scholarships funded by APC Microbiome Ireland. In March 2023 I will host a Jae-Pre student. Additionally, I have participated in 15 outreach activities since 2018.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
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| **Título:** | Analysis of compatible plant-virus interactions and influence of biotic and abiotic factors |

**Resumen de la Memoria:**

During my Master training, I analyzed the regulation of systemic necrosis (SN) in compatible plant-virus interactions, work that I performed under the supervision of Dr. Francisco Tenllado (CIB-CSIC). Thanks to this work, MAPKs and oxylipin biosynthesis genes were shown to act as positive regulators of this kind of necrosis. Shortly after, as FPU fellow, I continued with my Ph.D. in the same laboratory (2013-2017), analyzing the role played by certain viral suppressors of RNA silencing (VSRs) as key pathogenicity determinants, involved in viral interactions such as synergism, and responsible for the induction of unfolded protein responses (UPR) leading to SN. We exposed the role played by PVXP25 as the main pathogenicity determinant responsible for SN in PVX-associated synergisms. I completed these research works with a short stay in Dr. Peter Moffett¿s Lab at UdeS (Canada), which allowed us to discard a contribution of putative resistance factors or silencing machinery in the induction of SN. During my Ph.D, I also analyzed the effect of environmental factors associated with climate change, such as high $CO_2$ levels and temperature, in the outcome of mixed viral infections: this line of research showed a marked, differential effect of climate change on single vs. mixed infections, which may imply pathological consequences in the near future. Under the same project, we also assessed the trade-offs established in plant-virus interactions under changing environmental conditions, describing the existence of virus-induced tolerance to both biotic (bacteria) and abiotic (drought) stress. During my postdoctoral research, once in Rosa Lozano-Duran¿s lab at PSC (Shanghai, China), I focused my research on the analysis of the VSR activity of C4 protein from tomato yellow leaf curl virus (TYLCV), and its role as pathogenicity determinant. Thanks to these works, we showed how C4 is the main viral protein responsible for the appearance of symptoms in the plant by deploying a host-mimicking protein domain; furthermore, we provided compelling evidence that induction of symptoms is key for the attraction of the insect vector. In 2020, with Rosa Lozano (PSC) and Eduardo R. Bejarano (IHSM) as supervisors, I received a Marie Sk&#322;odowska-Curie fellowship with the research project "GeminiDECODER", aimed at using the viral protein C4 as a probe to isolate and analyze mobile small RNAs in plants. We exposed the ability of this protein to interfere with the movement of both siRNAs and miRNAs and the key role BAM1-2 receptor-like kinases play in regulating the cell-to-cell movement of these RNA species, determining, for example, the proper root xylem patterning. As future research interests, I would like to focus on plant defence responses against pathogens, specifically on regulatory mechanisms based on mobile sRNAs. Mobile sRNAs are molecules able to transmit positional information, and there is also evidence that key components in plant defence mechanisms, such as elements in the RNA silencing pathway or resistance (R) factors, are all subjected to regulation by RNAi. It is tempting to speculate that some of these mobile sRNAs could be involved in the activation of defence responses systemically, prior to the arrival of the pathogen. This line of research would present novelty, relevance and impact, offering alternative ways to improve crop production.

**Resumen del Currículum Vitae:**

I am a Postdoctoral Researcher at IHSM, Marie Sklodowska-Curie fellow in Dr. Eduardo R. Bejarano's Group. I obtained my Ph.D. in Biochemistry, Molecular Biology and Biomedicine (2017) in Dr. Francisco Tenllado's Group (CIB-CSIC), analyzing compatible plant-virus interactions leading to the most extreme symptom: the appearance of systemic necrosis (SN), which kills the plant in few days. Our research contributed to greatly improve the knowledge regarding this topic in key aspects such as: SN gene regulation, viral proteins responsible for SN, and molecular mechanisms by which these viral factors exert SN. We also investigated the effect of environmental factors related with climate change on the outcome of viral infections, with an international project shared between CIB-NIHHS (Korea). In addition, we also contributed to a novel understanding of the plant-virus interactions leading to beneficial effects in their hosts, such as the appearance of virus-induced tolerance to additional stress. In 2015, I spent a short research stay in Dr. Peter Moffett's Group (UdeS, Canada), where we started a fruitful collaboration leading to shared publications, analyzing the involvement of the plant RNA silencing machinery in SN. In order to gain deeper knowledge in relevant plant-virus interactions causing significant loses in crops, such as those affecting tomato crops, I made my postdoctoral research in Dr. Rosa Lozano-Duran's Group at PSC, Chinese Academy of Sciences (CAS, Shanghai), analyzing molecular interactions between tomato-geminivirus (2019-2022). Once there, I was awarded a prestigious, competitive postdoctoral PIFI fellowship (CAS), a Foreign Expert award (Foreign Affairs of China), and a Young Investigator project (NSFC) as Principal Investigator, with a research project aimed at using viral proteins as probes in plants. In this stimulating, international environment, we were able to stablish collaborative works with relevant scientist in the field, such as Dr. David Baulcombe (UK) or Dr. Terao Morita (Japan), generating shared publications. In 2021, with Rosa Lozano (PSC) and Eduardo R. Bejarano (IHSM) as supervisors, I was awarded a Marie Sk&#322;odowska-Curie Fellowship (MSCA global), with the project GeminiDECODER, aimed at isolating and analyzing mobile sRNAs by using a viral protein as probe. These research works confirmed the feasibility of using viral suppressors of the RNAi to interfere with the movement of both siRNAs and miRNAs, exposing the regulatory bases of their movement, and the central role they play as morphogens in processes such as root xylem patterning. In July 2022, I joined IHSM, in order to analyze resistance in tomato-geminivirus interactions. I have been involved in 2 national and 4 international research projects, acting as PI of one of them (NSFC). As a result, 21 articles have been published in well-respected journals such as PNAS or New Phytologist. Among them, I am first author of 11 articles, and contributing author of 10 more, including first author of a preprint. I contributed with both oral presentations and poster communications to scientific conferences, and frequently participated as reviewer for scientific journals. I have supervised PhD/MSc students in their respective works, and participated in teaching activities for undergraduate students at Complutense University.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | GIL SOLSONA, RUBÉN |
| **Referencia:** | RYC2023-043202-I |
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| **Título:** | From food contaminants determination to human exposome assessment |

**Resumen de la Memoria:**

I conducted my PhD studies at the University Jaume I, Castellón, with a focus on food authenticity and aquaculture production enhancing. After that, I joined the Catalan Institute for Water Research (ICRA). During this stage, I carried out research on the evaluation of contaminants in various environmental compartments, including environmental and food matrices. During this period, I carried out research stay at the National and Kapodistrian University of Athens, Greece (6 months), where I started working in the field of wastewater epidemiology and explore its possibilities to evaluate unintentional human exposure to hazardous chemicals.

In October 2020, I moved to the Institute of Environmental Assessment and Water Research (IDAEA-CSIC) in Barcelona, securing a co-financed Talent Attraction contract (Severo Ochoa program). This move marked a shift from environmental to human biomonitoring. In the framework of this position I conducted a research stay at the Swedish University of Agricultural Sciences in Uppsala (6 months), collaborating with leading scientists of agricultural analysis. It was during this period that my interest in the human exposome, particularly its link with food, become my main interest. The valuable connections established at that time will play a key role in the future research line I want to start. At IDAEA, I actively contributed to the establishment of a new research direction, based on the nontarget analysis of contaminant in various human matrices. This collaborative effort involved close coordination with the National and Kapodistrian University of Athens, where I'm currently working in my Marie Curie MSCA PF project.

My primary objective is to initiate a new research line focused on evaluating the human exposome, with a specific emphasis on food. This new research line leverages my strong knowledge on analytical method development for both food and human matrices, as well as in nontarget screening. I have curated an average Spanish food basket, along with experts in Sociology collaborating with CIS, comprising a selection of food products from major Spanish supermarkets, representing 95% of the food consumed across different social strata. Then, I will study both human exposome coming from diet and differences in social classes. This line will be also extended to a European level, with my collaboration with the Swedish University of Agricultural Sciences (Sweeden) and Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail (France). The main goal is to obtain a European perspective on the food-related exposome. This collaborative effort aims to provide a comprehensive overview that will extend to other European agencies or researchers within the framework of PARC (Partnership for the assessment of Risks from Chemicals). Both IDAEA and SLU (as well as my current group in Athens) are active participants in PARC, and the leadership of this partnership is held by ANSES. The intention is to share and disseminate findings, fostering a collaborative network to comprehensively assess risks from chemicals on a European scale.

**Resumen del Currículum Vitae:**

My career has been completely performed away from my forming University, in both national and international research centers. During this period, I achieved an exceptionally strong track record in conducting interdisciplinary research on environmental chemistry, with most of my research papers published in the best journals in the field (some of them with IF>10). Overall, my research has been published in 33 peer-reviewed papers (11 first authorships, 4 senior papers), and a book chapter. Given my expertise, I'm acting as regular reviewer in leading journals in my field (with a total of 35 works revised in leading journals such as Environmental Pollution (IF: 8.9), Environmental Science & Technology (IF: 11.4), or Journal of Hazardous Materials (IF: 14.2)). I've been part of the organization committee of one international conference (LC-MSMS 2021) and I'm currently involved in the organization and chairing of two other conferences (SETAC 2024, CEST 2025). Additionally, I serve as an evaluator of international projects including the Wisconsin Water Resources Institute, USA.

I am currently working at the National and Kapodistrian University of Athens on my Marie Curie project (with a success rate of less than 12%), which I consider a significant achievement. At present , I am officially co-supervising four PhD students, primarily at IDAEA-CSIC and in my current position in Athens. It's noteworthy that I have already published as a senior author (last or corresponding) with all of them. Additionally, I am the PI of two projects. In my senior stage, I have published articles as the main author in high-impact journals (such as Journal of Hazardous Materials (IF:14.2), where I have published 2 of my 4 articles as senior researcher). Notably, I have published impactful publications in high IF journals in all my research stays. Examples include Environmental Pollution, IF: 8.9, Environmental International, IF: 11.8 and Trends in Environmental Analytical Chemistry, IF: 11.2.

I have demonstrated my independence, with >75% of my papers published without the involvement of any of my PhD supervisors. Additionally, I have showcased and scientific leadership by leading four works as last and corresponding author. My outreach capacity is evident through press releases at the national level, gaining significant coverage in both national and international media. Moreover, a high percentage of my works are in Open Access. Building a strong international network is a key aspect of my career, with 12 out of 32 publications within international collaborations, (with more than 80 international co-authors). Over the past 6 years, I have actively participated in international e research organizations, such as NORMAN and BP4NTA.

**Resumen de la Memoria:**

My research career started at the Valencian Agricultural Research Institute as a research assistant first and PhD student later when I studied regulated deficit irrigation (RDI) strategies and water stress detection methodologies on two of the main citrus varieties in Spain by production and planting area. These studies demonstrated the possibility of implementing a summer RDI strategy based on stem water potential thresholds and save water, control vegetative growth, and reduce costs associated with the crop management. This research was complemented with studies conducted at the universities of Florida and Lancaster on the physiological responses that water deficit exerts on plants and the mechanisms involved in drought tolerance.

My research line after earning the PhD was focused on determining water requirements of emergent crops, evaluation of emergent technology for plant water stress detection, and assessment of subsurface irrigation and nonconventional irrigation practices in horticulture with the general goal of optimizing on farm irrigation water management.

At Deakin University, where I am currently employed as a Senior Research Fellow, I have led the research lines on remote sensing for crop monitoring and soil-plant-water interactions in several projects. This research line has provided the cotton and rice industries of the Riverina in Australia with a machine learning model to monitor soil moisture from free satellite imagery for irrigation scheduling purposes and with a cloud based IoT platform to monitor and control irrigation in gravity surface irrigation systems. My research on an international project based on Southeast Asia identified water movement limitations in typical rice-growing soils of Cambodia and Laos that are a constraint for furrow irrigation systems and non-rice crop production during the dry season. This research provided possible solutions and sustainable livelihood opportunities for smallholder farmers of these countries. My work at Deakin University also includes policy relevance research with the participation in a series of contracts with the Victorian Mallee Catchment Management Authority in Victoria, Australia, for evaluation of the current irrigation best practices guidelines in the region and recommendation of possible solutions. Recently, I contributed to the first detailed assessment worldwide of the carbon footprint of irrigation dams. This research showed that despite farm dams being nutrient enriched surface waters, the carbon footprint of the studied irrigation dams in the Murrumbidgee, Australia, is smaller than expected based on estimates using global averages for artificial water bodies, suggesting that a revision of the subcategories for irrigated sub-catchments in the Intergovernmental Panel on Climate Change is required.

Currently, I am working on irrigation automation technology for gravity surface irrigation systems of the rice industry and its implementation as the enabling technology for the wide adoption of aerobic rice production by rice growers. This research is conducted in parallel with a research line on soil and water management of young almond trees on heavy clay soils that I am leading with the goal to develop key knowledge on water use characteristics of almond varieties being grown on heavy clay soils and identify threatening processes to achieve sustainable production.

**Resumen del Currículum Vitae:**

I have got a bachelor's degree in agricultural engineering obtained at the Valencian Polytechnic University (UPV, Spain). My research career started at the Valencian Institute of Agricultural research (IVIA, Spain) where I worked as a research assistant for a year before starting my PhD thesis on regulated deficit irrigation of citrus trees funded by an FPI-INIA grant. My research education was complemented with short stays at the universities of Florida (USA) and Lancaster (England). The scientific achievements obtained during my PhD were recognized by UPV with the international mention and PhD thesis award.

During my postdoctoral stage, I obtained a grant from the COST Action EURO-AGRIWAT to access a training school on water footprint application for water resources management in agriculture held in Firenze, Italy. In 2015, I secured a 'JdC formación' grant (ranked 1st within the area of Agriculture). I resigned to this grant to join Deakin University in Australia to work in the Irrigation Research Laboratory Group of CeRRF as a Research Fellow. At Deakin University, I have directly participated in the attraction of external funding ($973.946) and I am Associate Supervisor of PhD candidates (one completed and another in his last year) researching on aerobic rice production systems. I have led research that investigates a critical issue for regional Australia with a move to high value horticulture on heavy soils and aims to build resilience to drought.

During my career, I have participated in 24 projects. My research has demonstrated there is opportunity for saving water in horticulture by implementing non-conventional irrigation practices and has provided new methodologies for a more efficient use of the water resources in subsistence and commercial agriculture. Research in a project based in Southeast Asia where I participated, identified water movement limitations in typical rice-growing soils of Cambodia and Laos that are a constraint for furrow irrigation systems. This research provided possible solutions and sustainable livelihood opportunities for smallholder farmers of these countries. My research has directly informed policy makers in the state of Victoria, Australia, about flaws in the current irrigation practices guidelines and proposed possible solutions to overcome such flaws. Recent research conducted for the cotton and rice industries in collaboration with irrigators and industry has provided affordable automation technology for these industries and opportunity for labour savings, enabling the adoption of water saving rice culture with potential to have a high impact from a sustainability point of view.

The outcomes from my research have been communicated in 51 peer-reviewed articles (34 in journals, 15 in proceedings and two book chapters), more than 35 non-peer reviewed articles (proceedings, technical reports and extension) and 32 participations in conferences/symposiums/workshops (two as invited speaker). According to Google Scholar (on 27/01/2024), my work has received 1.416 citations (925 in Scopus) and my h-index is 19 (17 in Scopus). Sixteen of my publications are in the top 25% most cited documents worldwide (Scopus). In the last five years, I have participated as external evaluator of research projects and examiner of PhD thesis for international Universities, guest editor and reviewer of scientific journals.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | MARIN LOPEZ, ALEJANDRO |
| **Referencia:** | RYC2023-043988-I |
| **Correo Electrónico:** | a.marin.lopez@hotmail.com |
| **Título:** | Vector-virus-host interactions and vaccine development |

**Resumen de la Memoria:**

The epidemiology of arboviruses is changing worldwide. Rift Valley fever (RVFV) and Crimea Congo Hemorrhagic fever (CCHFV) are hemorrhagic zoonotic arboviruses, affecting multiple livestock and human and have potential risk of emergence in the Mediterranean region. How these viruses interact with their hosts to impair their immune system and cause the strong associated pathology is poorly understood. Consequently, the study of virus-host-vector interactions in the frame of "One Health" is critical to 1) increase the knowledge about how these viruses manipulate both host and vector immune responses and 2) define antiviral and prophylactic treatments to combat these diseases, as there are no licensed vaccines.

As a PhD student in the lab of Dr. Ortego at the BSL3 Center of Animal Health Research (CISA) I (I=we) worked on the design of recombinant vaccines against different arboviruses, like AHSV and BTV. As an Associate Research Scientist at Yale University, I focus on the study of mosquito salivary-host-arbovirus (DENV, ZIKV). To unravel them, we performed a high-throughput human exoproteome (ectodomains of surface receptors and secreted molecules) yeast screening, identifying a strong interaction between salivary Nest1 and the human CD47, validating this interaction by molecular and biophysical techniques and studying its influence over the host immune responses and (work under revision). In a similar fashion, I am currently trying to unravel interactions between some soluble antigens (like NS1) from DENV and human factors.

Following my current work at Yale University, my main research aims will be to study:

1) virus-host-vector interactions of emerging arboviruses (RVFV and CCHFV). I will generate recombinant Glycoprotein 38, NSs, Gn and Gc viral proteins and, following the methodology described above, these will be screened using the human exoproteome yeast platform to look for potential interactions, in collaboration with my current lab at Yale University. Further validation by flow cytometry and surface plasmon resonance will be performed. These proteins have been shown to promote virus infection by altering the immune system, but many molecular mechanisms remain undiscovered. This analysis will lead to:

2) the study of the molecular mechanisms which underlie these new potential interactions and their effect on the immune response and pathogenesis in the mammalian host. in vitro and in vivo studies will be performed, by overexpression or knock-down/out (siRNA or CRISPR) of the specific target. The implication of the identified host protein will also be tested using knock-out mouse models for the host protein. Viral replication and host immune responses and pathogenesis will also be studied. Finally, these results will be applied to the research proposed in the third Aim of the project.

3) the development of therapeutic and prophylactic tools as antivirals or vaccines. Some of the host factors identified in the previous Aims might be host antiviral molecules targeted by the virus to inhibit their functions. Therefore, therapeutic treatments directed to recover the normal levels of the host molecules targeted by the viral antigens can be performed. Vaccine candidates will be generated, expressing both viral antigens and virus-targeted host factors. Efficacy will be tested in treated and immunized animals.

**Resumen del Currículum Vitae:**

Alejandro Marin Lopez completed his doctoral thesis at the Center for Animal Health Research (CISA-INIA-CSIC) in Madrid under the supervision of Dr Javier Ortego, developing multiserotype vaccines against orbiviruses. Subsequently, he carried out two postdoctoral periods: 5 months at CISA and 5 years and 10 months (until this date,15th Jan 2024) at Yale University School of Medicine (USA). He has been promoted to Associate Research Scientist and currently in the process of being promoted to Research Scientist. His research focuses on the study of vector-virus-host interactions (specially for Aedes-dengue/zika-mouse/human) and vaccine development. He has mentored multiple students, from undergrad to visiting PhD students. This work has led into multiple publications, conference presentations as well as dissemination articles and numerous collaborations have emerged with international groups and pharmaceutical companies such as L2Diagnostics. He has participated in 33 publications, 14 as first author, 4 as last author, in addition to 47 communications in national and international meetings. He has been invited as a speaker for the course "Viruses and Disease" held in Universidade de Santiago de Compostela (2019 and 2022), the master of Virology at Univ Complutense de Madrid (since 2016) and other lectures in research institutes like CISA-INIA. ExpertScape portal ranked him as one of the most influential Spanish researchers in Animal Health (n 53). He has been Principal Investigator for a NIH grant STTR1 for the generation of mosquito salivary-based vaccines against flaviviruses and participated in other grants as key personnel.

At the scientific management level, he is in charge for the rooms assigned for Prof Fikrig in the BSL3 and Insectarium facility at Yale, both subjected to a tight control and evaluation from state and federal organisms like CDC and Connecticut Department of Public Health. He is also in charge of animal and virus protocols (SOPs), in accordance with IACUC (institutional animal care and use committee) and Yale EHS (Environmental Health and Safety) guidelines.

**Área Temática:** Ciencias agrarias y agroalimentarias
**Nombre:** GHERARDI ARBIZU, LAUREANO
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**Correo Electrónico:** lau.gherardi@berkeley.edu
**Título:** Precipitation extremes and nitrogen availability control root productivity in drylands ecosystems

**Resumen de la Memoria:**

I am a global ecosystem ecologist who combines manipulative experiments with ecological data synthesis at multiple temporal and spatial scales to advance our understanding of how interacting Global Change stressors such as climate change, land use change, and nutrient deposition affect the functioning of grassland ecosystems. Specifically, I am interested in the effects of resource availability variance on belowground processes that determine overall ecosystem responses to climate variability, land-use change, and anthropogenic nutrient deposition. I carry out research using complementary approaches that result in compelling conclusions that allow land managers and decision-makers to achieve a sustainable future for high-value rangeland ecosystems. I focus on rangelands (broadly defined as arid-, semi-arid and dry-subhumid areas dominated by herbaceous vegetation) because they cover 41% of the terrestrial ecosystems, host over 30% of the human population, account for 50% of meat production and sequester 35% of the carbon fixed globally. While my research focuses on the fundamental science of grassland and shrubland ecosystems, it has immediate applications in conservation/restoration and sustainable agriculture. These applications make my work relevant and well-positioned for seek funding from sources. I have over a decade of experience working at highly renowned national and international research institutions. During this time, I have carried out a range of greenhouse, field, and modeling experiments. I have contributed to numerous grants from multiple agencies that funded my research and salary, and have gained great experience managing projects, budgets, and people.

**Resumen del Currículum Vitae:**

I have built my scientific career working in multiple countries including field expeditions to Argentina and the United States but have also carried out multiple global scale research projects working across many countries. This experience is evident in my publication list. I am a plant ecologist addressing fundamental and applied questions about how global change stressors such as extreme climatic events affect the structure and functioning of ecosystems from local to global scales. Projections of climate change anticipating increases in precipitation variability and the frequency of extreme events are part of the public and scientific narrative. However, the effects of inter-annual precipitation variance per se on ecosystem functioning have been largely understudied. My dissertation research pursued elucidating the effect of precipitation variance independent from changes in mean precipitation on ecosystem functioning and biodiversity. Studying variability effects at the inter-annual scale was an enormous challenge. I overcame such a challenge by: 1- designing a tool that allowed me to effectively decrease and increase precipitation across experimental treatments (Gherardi and Sala 2013 Ecosphere); 2- carrying out a six year-long experiment that demonstrated effects on primary productivity (Gherardi and Sala 2015 PNAS) and functional diversity (Gherardi and Sala 2015 Ecology Letters) and; 3- combining experimental results with synthesis (Gherardi and Sala 2019 GCB) and modeling (Sala, Gherardi and Peters 2015 Climatic Change), which allowed me to explore larger spatial and temporal scales.

During my postdoc, I steered the focus of my research to yet another understudied but crucial dimension of global change, belowground processes. Funded by a collaborative NSF grant that I coauthored, I led a multi-site and large-scale field experiment where we explored the effect of precipitation extremes on the fraction of productivity allocated belowground. We tested the direct effect of precipitation and the effect of extreme precipitation through changes in the soil food-web. Complementing this experiment, I led a global estimation of the fraction of productivity allocated belowground that supports patterns found in the field. I also tested two different interactions between global change stressors. First, we tested the effect of nutrient addition on the ecosystem sensitivity to the 2015-2017 drought and compared annual grasslands in California and perennial grasslands of the great plains. Second, we tested the effect of nutrient addition and grazing on soil carbon and nitrogen stocks.

Working at Arizona State University I held a double appointment as Assistant Research Scientist and as the Senior Manager of the Global Drylands Center. This experience positioned me as a leader and gave me experience managing teams, organizing conferences and workshops, balancing budgets, and writing reports to university and state authorities. This scientific center aimed at fostering global collaborations across institutions around the globe including King's College, London, University of New South Wales, Australia, Ben-Gurion University of the Negev among other. I led activities promoting research and education on Dryland Ecology.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | CABALLERO GÓMEZ, NATACHA |
| **Referencia:** | RYC2023-043075-I |
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| **Título:** | Sustainable Disinfection Strategies, in order to avoid the transmission of resistances to antibiotics and biocides, through the food chain. |

**Resumen de la Memoria:**

The principal line concern to the great interentst in the search of novel strategies using natural approaches to control the persistence of resistances associated with industry sanitation. Trends in the transmission and emergence of antimicrobial resistences through the food chain reinforce the needs to investigate several alternatives for disinfection. In this context, principal research line concern about Sustainable Disinfection strategies, in order to avoid the transmission of resistances to antibiotics and biocides, through the food chain.

During scientist career the candidate has worked in this line using different approaches:

In predoctoral stage studied "Interactions between enterocin AS-48 and biocides against Gram positive bacteria of concern in the food industry" and in postdoctoral stage continued with the study of: "Protective biofilms against avoiding contamination of surfaces by pathogenic microorganisms".

Moved by the interest in the application of new disinfection strategies In 2017, I began working in the company ACMarca as Innovation Project manager, directing and managing innovation projects focused on the development of more "green" disinfectants. With the development of this project, the line of research in disinfectants for commercial use was strengthened, being the product currently developed in the market, sold as Sanytol textile disinfectant. The candidate contributed a scientific vision in the development of the product, managing to reduce the concentration of quaternary ammonium present in the formulation, betting on the introduction of natural compounds produced by bacteria highly aligned with Green Deal strategies like lactic and acetic acid.

Next, in 2020, I worked as a Microbiology Manager for the juice company AMC, with high international portfolio. This work was focused on managing a team composed by three laboratories, two of them located in Murcia and a third with international location, in Holland Vlissingenh. Supervising a team of more than 20 workers, composed by technicians and laboratory coordinators. A deeper knowledge was obtained in my leadership, administrative and human management actions, as well as a greater deepening in real needs of the food industry mainly in issues of disinfection and food safety.

Since 2021 up to November 2022, I was a beneficiary of a contract associated to the project "Strategies for the reversal of antibiotic resistance in multidrug-resistant bacteria present in the food chain" (Junta de Andalucía) which reinforced my research trajectory with the aim of managing and leading research projects within the line of the study of antimicrobials and human health. In this point, I want to mention 2 scientific publications as first author in open access format, detailed below, second of them published inside a postdoctoral contract achieved, under the University of Jaén's own plan.

**Resumen del Currículum Vitae:**

PhD with International mention in Food Safety by the University of Jaén (23-09-2013) with the collaboration of the University of Strasbourg, Faculty of Pharmacy, Analytical Chemistry Team (1/05/2012-31/07/2012). The thesis entitled "Interactions between enterocin AS-48 and biocides against Gram-positive bacteria of interest in the food industry" has focused mainly on the study of the synergies between the disinfectants used in the industry and the natural antimicrobial enterocin AS-48 with the aim of eliminating bacteria in planktonic and biofilm state, using among others, the most advanced omics techniques such as "proteomics". The results obtained in the PhD open up new possibilities for the application of enterocin AS-48 in combination with biocides to reduce the generation and spread of resistance in the food chain. During the development of my doctoral thesis developed as a FPI fellow, 4 publications were obtained as first author, in high impact journals; of special relevance is the following: "Comparative proteomic analysis of Listeria monocytogenes exposed to enterocin AS-48 in planktonic and sessile states" which was published as a result of the short predoctoral stay carried out by the applicant for 3 months in the laboratory of Bioactive Molecules, UMR 7178.Subsequently, 2014-2017 I developed my postdoctoral training at the University of São Paulo (Department of Food and Experimental Nutrition, Food Microbiology, Faculty of Pharmaceutical Sciences) focusing on interspecific microbial relationships in biofilms by using

proteomic approaches and studying the formation of protective biofilms with lactic acid bacteria, with the aim of innovating sustainable disinfection in the food industry. During this period, I have directed a Scientific Initiation Project, as well as participated in training activities aimed at completing my methodological training. In 2016-2017, a postdoctoral stay at the University of Strasbourg, Faculty of Pharmacy, Analytical Chemistry Team was carried out in association with this project. During my postdoctoral stage, extensive knowledge was consolidated in proteomic techniques applied to the study of biofilms, as well as studies of probiotic characteristics to obtain useful biomarkers. Between 2018-2020 I have worked in the chemical and food industry, performing functions of Poject manager and Microbiology Manager, in two companies with high international impact ACMarca (Barcelona) and AMC (Murcia) strengthening the line of research in disinfectants for commercial use, being the product currently developed in the market, marketed as textile disinfectant Sanytol. On the other hand, working as Microbiology Manager for the juice company AMC, I gained more knowledge in leadership actions, administrative and human management, as well as a deeper understanding of the real needs of the food industry, mainly in terms of disinfection and food safety. In 2021 I started working as a research associate for Professor Dr. Hikmate Abriouel in the framework of the project "Strategies for the reversal of antibiotic resistance in multi resistant bacteria present in the food chain (Ref. P20_00983)".Consejería de Conocimiento, Investigación y Universidad (Junta de Andalucía). I am currently working on a postdoctoral fellowship associated with this project, funded by the University of Jaén's own action 7 plan.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | SERRANO BUENO, GLORIA |
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| **Título:** | Photoperiodic control over plant development |

**Resumen de la Memoria:**

My scientific background, enclosed in the field of Molecular Biology and Biochemistry, is characterised by a multidisciplinary approach, including diverse model organisms, approaches, and skills. During my PhD and firs postdoctoral position, at the Institute of Plant Biochemistry and Photosynthesis (IBVF-CSIC), I was focused on Pyrophosphate homeostasis in yeasts. Then, in my postdoctoral period in Ecuador, I identified new strains of native yeasts from extreme ecosystems contaminated with heavy metals with application in bioremediation. When I returned at IBVF, at "Molecular bases of plant development and metabolism" group, I took up my scientific field in the photoperiodic control over flowering, which I started in 2009 during my internship.

Photoperiod or day length responses have become essential for plants to time their developmental decisions to the changing seasons. The absolute necessity to optimize light input, their major energy income, has imposed in plants a severe control over their developmental programs. Among the crucial decisions in a plant life cycle, the floral transition is key, as it compromises the success of the offspring and in our own interests, determines the post-harvest quality and the garden performance of ornamental plants. These are landmark aspects of Agri-biotechnological improvement programs, and therefore major discoveries in photoperiod regulation can turn into immediate agriculture and ornamental industry applications. In Arabidopsis thaliana, the gene CONSTANS (CO) represents a central hub that controls photoperiodic flowering induction in leaves. CO mRNA expression is regulated by circadian and photoperiodic inputs while CO protein stability is controlled by photoreceptors, E3 ubiquitin ligases and through the interaction with other proteins. These complex regulatory layers allow the correct expression of the florigen FLOWERING LOCUS T (FT) gene. FT protein moves through the phloem to the shoot apical meristem (SAM) to induce the activation of the flower developmental program. This regulation allows the control of CO amount by employing an external treatment, such as modifying day length or light quality: Long days (LDs) and blue light (BL) stabilize CO, whereas short days (SDs) and red light (RL) promote its degradation. Recent advances have identified that CO expression remains in almost all organs along Arabidopsis development. Why is CO expression maintained in these organs even when flowering has already been triggered? Does it have other roles other than the flowering induction?

The aim of this research line is to unveil how environmental changes, particularly those related with light (daylength and light quality), are integrated with internal signals as epigenetic marks to affect distinct growth phases and transitions throughout a plant life cycle. To demonstrate this, I will use the model plant Arabidopsis and other crops with agri-food interest as Petunia and tomato. Based on preliminary work and literature reports, I propose that photoperiod, through CO, controls a vast majority of the plant development checkpoints through the induction of transitions between phases and the reduction of organs growth phases. Thus, by modifying the photoperiodic signal (LD/SD, RL/BL), we could modulate developmental processes in order to enhance crop yields and quality.

**Resumen del Currículum Vitae:**

My scientific career has been framed in the field of Molecular Biology and Biochemistry. I performed my internship at the "Molecular bases of plant development and metabolism" group (IBVF, Spain). During this stage, I described, in plants and algae, the first component of an ancestral photoperiodic route, published in the highly rated journal Current Biology.

Later, I joined the group "Phosphate Bioenergy" (IBVF) in which I did my postgraduate studies (MSc and PhD) with financing of an Excellence Fellowship from Junta de Anadalucía. Among the most relevant results of this stage, I would like to highlight the first description of cellular effects related with cell death due to the accumulation of inorganic pyrophosphate in eukaryotic cells, the subcellular localization of the protein that keeps low levels of this metabolite in yeast cells, and the mechanisms involved in its degradation. Research outputs were published in the Journal of Biological Chemistry and BBA - Molecular Cell Research. After my PhD with highest honors, I gained a post-doctoral Excellence fellowship from Junta de Andalucía.

After this period at IBVF, I obtained a competitive Lecture-Researcher contract at the Technical University of Ambato (UTA, Ecuador). As lecturer, I was Main Lecturer of Biochemistry I and Biochemistry II at Biochemistry degree for two years. As researcher, I was able to form my own research group "Biodiversity of yeasts with environmental interest". The first goal as IP was finding independent finance support, which I obtained from a competitive Program from the Ecuadorian Secretariat of Higher Education, Science, Technology and Innovation. I was thus able to perform my own research project "Bioremediation of heavy metal contamination using native yeasts from Ecuador". The aim of this project was to identify and apply in bioremediation new strains of native yeasts from extreme ecosystems contaminated with heavy metals.

After this stay, I moved to the Plant Development Unit (IBVF), for the first stage, I took up the photoperiodic signal research as work team member of two project "Interacción entre las señales de nutrientes, luz y temperatura en la transición floral en Arabidopsis" and "Integración del fotoperiodo con señales fisiológicas y ambientales en plantas. I highlight during this stage two papers published in Current Opinion in Plant Biology and The Plant. In 2019 I got an international highly competitive and prestigious Marie Curie Individual Fellowship MSCA-IF with a project "Role of CONSTANS in flower longevity" from European Commission. This grant allowed me to start my own research line at the IBVF based on photoperiodic signaling in plant development and exploring new biotechnological applications. I highpoint a review paper published in Frontiers in Plant Science, and a paper in Molecular Plant, both as first and corresponding author. My MSCA-IF gave me the opportunity to apply and gain a novel call to extend of MSCA-IF project supported by CSIC. The aim of the new project namely "Role of CONSTANS-homologue in Petunia flower senescence" is to apply the results of my MSCA-IF in the ornamental plant Petunia. Up to date, this project is already working out and is showing encouraging results.

I recently got a Researcher Lecturer contract included in the stabilization plan of the University of Seville.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Ciencias agrarias y agroalimentarias
**Nombre:** SÁNCHEZ VERA, VICTORIA
**Referencia:** RYC2023-044355-I
**Correo Electrónico:** victoriasv39@gmail.com
**Título:** Estudio de la autofagia y su aplicación en la mejora de cultivos vegetales

**Resumen de la Memoria:**

My research is centered on enhancing the sustainability and competitiveness of agricultural crops, with a specific focus on strawberries. This is achieved through the investigation and application of autophagy, the cellular recycling system. During my career, I have studied the role of autophagy in processes of agronomical importance such as somatic embryogenesis in the Norway spruce tree (Picea abies), fruit ripening in strawberry, plant resistance to stress, and fundamental processes as gamete differentiation. I started as predoctoral fellow in 2006, in a transfer of knowledge project between Malaga University (UMA) and the company Eurobosques S.A. From 2008 to 2013, I did my thesis at UMA funded by a FPI fellowship, performed 4 international stays at Swedish University of Agricultural Sciences (SLU, Sweden) and studied the molecular determinant of somatic embryogenesis in Norway spruce, a tree of high importance for wood production. We showed that the autophagy pathway and the enzyme Separase are essential for the proper formation of the embryo suspensor and therefore, for somatic embryo development (Minina EA et al. J. Cell Biol. 2013; Moschou PN et al. New Phyt. 2016). I also studied the role of autophagy as promoter of lifespan and how its induction can improve plant capacity to adapt to stress. We proved that increasing plant autophagy levels transcriptionally leaded to bigger plants, with higher seed production, more resistant to certain stresses and that lived longer (Minina EA*, Sanchez-Vera V* et al Aging Cell 2013; Minina EA et al. J. Exp. Bot. 2018), results of high relevance from the agronomic point of view. Shortly after defending my PhD thesis, I started as postdoctoral researcher at SLU (Sweden), where I spent 4 years as autophagy expert studying this process in gamete differentiation in the early land plant Physcomitrium patens. I was responsible for this research line and showed that autophagy is essential in the differentiation of moss gametes and that its role is conserved in different kingdoms (Sanchez-Vera V. et al Autophagy 2017). During that time, I did a postdoctoral stay at the U. of Zurich (Switzerland) where I developed a protocol for single cell isolation by laser-assisted microdissection (LAM). We described the egg transcriptome and we successfully identified 2 essential genes for P. patens sexual reproduction: PpBNB and PpMS1 (Sanchez-Vera V et al. New Phyt. 2022; Landberg et al. New Phyt. 2022). In 2019, I was awarded a competitive Marie Sklodowska-Curie Individual Fellowship (UE) to work at IHSM-UMA-CSIC, establishing a new research line that studies strawberry fruit ripening and how it is regulated by autophagy. We showed for the first time the importance of autophagy in the ripening of a fleshy fruit (Sanchez-Sevilla JF .and Sanchez-Vera V. Front. Plant Sci. 2021). Since October 2021, I am independent researcher at IHSM, funded in the highly competitive JIN call (Joven Investigador – AEI). In my JIN project I study the role of autophagy induction in drought stress resistance in strawberry and the regulation of autophagy during strawberry fruit ripening. Obtaining a Ramón y Cajal fellowship would allow me to consolidate my research group at IHSM and continue developing my research program focused on the study and use of autophagy as a biotechnology tool to improve crops.

**Resumen del Currículum Vitae:**

I am an independent researcher at IHSM-UMA-CSIC (Malaga) studying autophagy during strawberry ripening and trying to improve strawberry resistance to drought stress by autophagy manipulation. I hold the R3 certificate (AEI), which proves the quality of my scientific career.

I have contributed significantly to increase the knowledge about the role of autophagy in plant development. My 10 publications accumulate 1504 citations, and all are in Q1 high impact factor journals (7 of them of D1). Notably, five of my contributions are considered referents in the field of autophagy in plants and have been extremely highly cited.

My work was selected for 17 communications in 13 conferences (10 international), 8 as oral communications, being first or last author in 11 of them. I was invited as speaker in two seminar series i) CRAG (Barcelona) Seminar Series 2023 "New perspectives from Junior Researchers" and ii) IHSM (Malaga) Seminar series 2023. I was member of the organization committee of the XV Reunión de Biología Molecular de Plantas.

I have participated in >15 outreaching activities, highlighting i) the video "Investigando las plantas – El musical" (more than 2500 views in youtube), ii) Yincana Plant Prix for the European Researchers Night 2022 and 2023 (ca. 12000participants/year) and iii) press releases of my strawberry work referenced in EuropaPress, LaVanguardia and Canal Sur TV.

I established and managed the Laser Assisted Microdissection platform at SLU (Sweden) for 16 months. I am scientific coordinator for the Servicio de Macromoleculas at IHSM.

My scientific career has been developed mainly at an international level. I did 4 pre-doctoral and 2 postdoctoral international stays which allowed me to collaborate with top-level international researchers from different areas. I have participated in a total of 10 projects (5 international) justified by the international stays and publications.

I am external evaluator of the R&D Projects program for Uruguay and the Republic of Argentina. I am expert evaluator for the HORIZON-MSCA-PF-01 (EX2021D517948) and recently I have been appointed as evaluator of the EVALUA system of the AEI. I am regular reviewer for international indexed journals such as New Phyt., J. Exp Bot. or BMC Plant Biol.

I have obtained funding for three individual projects: i) a Marie Curie EF-ST 2018 from EU, ii) "Proyectos de I+D+i 2020 – Joven Investigador" (JIN-AEI) and iii) project from the UMA - FEDER - Junta de Andalucía in the call for "Investigador Emergente - 2020". Securing funding for more than 350K € in total.

I have published as corresponding author (postdoctoral stage) and as last author (as Marie-Curie fellow) in high impact factor journals. I am preparing a manuscript as last author with the results of my JIN project about the regulation of autophagy during strawberry fruit ripening and one as first author in collaboration with Prof. Stefan Rensing (U. Freiburg) about the sex-determinant genes in P. patens. I am also co-author in one preprint.

Besides my research, I have performed academic tasks including lectures and practical courses at the Biology degree and Master degree (more than 400 hours). I am co-directing a PhD Thesis and one master thesis, and I have supervised 5 master theses, 2 bachelor theses and 2 Erasmus+ traineeship students. I hold the Contratado Doctor certificate (DEVA).

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | MANUELIAN FUSTE, CARMEN LORETO |
| **Referencia:** | RYC2023-042902-I |
| **Correo Electrónico:** | mentxumf@gmail.com |
| **Título:** | Ruminants, dairy production and food quality assessment |

**Resumen de la Memoria:**

My scientific career can be divided into three stages: 1) doctoral training, 2) post-doctoral research in Italy, 3) post-doctoral research in Spain.

Six experiences stand out from the first stage: 1) PhD in Animal Production (2014) related to the application of conditioned food aversion for grazing in woody crops with small ruminants (Excellent cum laude and international mention); 2) Pre-doctoral fellowship BE-DGR2011 at INRA Clemont-Fd; 3) Nutritional scientist for a private company related to pet nutrition; 4) Freelance nutritional scientist with projects related to animal nutrition in dogs, cats, pigs, and poultry; 5) Official veterinarian substitute at the slaughterhouse to ensure the accomplishment of animal welfare, meat hygiene and statutory regulation; 6) Several dissemination activities (interviews, magazine articles, technical seminars, etc.). Recognitions received during this period were the Special Award for Doctoral Studies, the 1st Josep Séculis Award from the ACVC, and becoming a corresponding member of the ACVC.

The second stage includes most of my scientific production and the internalization of my career: 1) >55 peer-reviewed papers, 36 in Q1 Journals; 2) 31 oral and poster presentations in internal and national conferences; 3) Participation in two H2020 projects Organic-PLUS and INTACT as part of work package coordination team; 4) Participation in national R&D competitive and non-competitive projects in Italy; 5) Development of expertise in infrared spectroscopy mainly in milk and dairy products; 6) Dissemination activities (webinars, technical seminars, magazine articles, newsletter, etc.). Recognition received during this period is the Young Scientist Award 2022 of the EAAP.

The third stage includes the Maria Zambrano Post-doctoral fellowship, which is an international talent-attraction grant to be part of the Spanish R&D system. Five experiences stand out from this stage: 1) Mentoring undergraduate, master and PhD students; 2) Collaboration with Italian Universities receiving 2 PhD students for their stage abroad; 3) Theoretical and practical lessons in Veterinary and Food Science Degree at the UAB; 4) Involvement in Spanish national projects related to milk and/or the application of infrared spectroscopy; 5) PI of an R&D non-competitive project related to small ruminants and lactoferrin in milk.

**Resumen del Currículum Vitae:**

My PhD at the UAB focused on feed intake behavior and selective grazing in small ruminants by using conditioning feed aversion methods to make crop management more sustainable, within the 'Vino y Ovino' project founded by the Spanish government. Researcher for Affinity SAU (pet food company) focusing on the nutritional assessment of dogs and cats. Freelancer consultant in nutrition for different companies (e.g., Addimus SL, 333). Pre-doctoral internship in France at INRA Clermont-Fd through the competitive fellowship BE-DGR 2011 from the 'Generalitat de Catalunya'. Post-doctoral competitive and non-competitive fellowships at the University of Padova (Italy) at the DAFNAE department from 2016 to 2022 and at the UAB with the Maria Zambrano fellowships from 2022. During my post-doctoral period, I developed my expertise in infrared spectroscopy in milk and dairy products. I was involved in an Italian national project (INNOVAMILK) related to the use of infrared in dairy products, two EU-H2020 projects, and several contracts including one as PI. Organic-PLUS is related to reducing contentious inputs in organic production, while INTAQT evaluates the use of innovative tools for the assessment and authentication of animal products. In both projects, I participate in the coordination of a work-package (WP) establishing a close relationship with the project coordinator and partners. Throughout my career, I actively participated in experimental design, animal management, and data analysis. I also collaborated with industry and local producers producing divulgation activities: seminars, newsletters, workshops, interviews, articles, the scientific school calendar, and The Ball World. My communication skills are supported by publishing in peer-reviewed journals (59 articles), public presentations (including invited presentations) in national and international scientific meetings, divulgation articles, and writing research and grant proposals in different languages, some of which were funded. I work with several Q1 journals and associations as a reviewer (e.g., Journal of Dairy Science, Meat Science, ADSA, EAAP). Member of the 'Acadèmia de Ciències Veterinàries de Catalunya', of the editorial board of the AgriScience and Technology Journal, and co-chair of the YPN-EurAgEng. Organizing committee member of the 56th meeting of the SEEP2017. Awarded with the Special Award for Doctoral Studies and the 2022 EEAP Young Scientist Award. I have obtained the accreditation to become a university professor in Catalonia, Spain and Italy. As a post-doc, I become an active member of my research group, mentoring younger researchers and providing them support to achieve their goals (e.g., oral communications, papers, PhD). Moreover, I was a member of two doctoral thesis tribunals in Spain. I started a Journal Club to support younger researchers, and supervised undergraduate (UAB), Master (UAB, IAMZ, UNIPD), and PhD students (UNIPD, UNITO, UNINA).

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | FERNANDEZ DEL SAZ, NESTOR |
| **Referencia:** | RYC2023-044592-I |
| **Correo Electrónico:** | nestordelsaz@hotmail.com |
| **Título:** | Regulation of plant primary metabolism under plant symbioses with soil microorganisms and under different environmental stresses in vegetable and energy crops |

**Resumen de la Memoria:**

I am a plant physiologist with experience in leading my independent research on the regulation of plant primary metabolism under plant symbioses with soil microorganisms and under different environmental stresses in vegetable and energy crops (tomato, grapevine, tobacco, legumes and arundo). My major aim is to improve our understanding on the regulation of plant primary metabolism, which can be used to adopt sustainable options for better crop productivity in the upcoming global change scenarios.

In 2017, I obtained my PhD at the Universitat de les Illes Balears where I opened a new line of research by studying the role and regulation of respiration under abiotic stress and its interaction with arbuscular mycorrhizal fungi. In 2018, I moved to Chile where I worked as an assistant professor at the University of Concepcion teaching undergraduate and graduate courses, and leading a project Fondecyt Regular (2019-2023) focused on the regulation of plant respiration in the legume-rhizobium symbiosis. In 2022, I moved to Mallorca (Spain) where I work as postdoctoral researcher (MaríaNZambrano next-EU) and do research about the regulation of respiration in other plants species including crops, and under Mediterranean conditions.

**Resumen del Currículum Vitae:**

Among the most relevant achievements in my career I highlight the following: (1) contributions to the field of plant respiration and primary metabolism in 21 research articles (16 in D1, 5 in Q1), 2 review articles (1 in Q1, 1 in D1) and 4 book chapters, being first or corresponding author in 15 (of 27) publications since 2016, with 444 citations (20.9 citations per article) and a H index of 12; (2) establishment of an international network with more than 13 research groups from 6 different countries; (3) supervision of Bachelor, PhD Thesis and 800 hours of teaching experience since 2018; (4) sponsoring researcher in a Fondecyt Postdoctorado project (Fondecyt, Chile) and principal investigator and collaborator in two projects Fondecyt Regular (ANID, Chile); (5) reviewer in 30 manuscripts for different journals (e.g, Plant Soil, New Phytologist, Environmental and Experimental Botany, Plant Cell Physiology, Plant Physiology, The Plant Journal, Journal of Plant Physiology) and review editor for plant symbiotic interactions in Frontiers in Plant Science. I received a distinction to merit as young researcher granted by the University of Concepcion (2022). I am also accredited as Associated Professor issued by ANECA, and I have a Certificate of established researcher (Category R3) issued by AEI. Currently, my postdoctoral contract is about to end, and I will be unemployed looking for new opportunities to do research in Spain.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | SAATI SANTAMARÍA, ZAKI |
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| **Correo Electrónico:** | zakisaati@usal.es |
| **Título:** | Unveiling evolutionary features in bacteria adapting to the plant environment |

**Resumen de la Memoria:**

I started my PhD focused on descriptive interactions between plants and insects plants and insects important in Agriculture and Silviculture, by analyzing the host microbial diversity and their functions. Over the advance of my research, I moved to provide more details on such interactions, by finding bacterial genes tightly associate with their hosts or niches through both transcriptomics and comparative-genomic analyses, and, in a broader sense, in the study of ecology, taxonomy and evolution of bacteria. Now, I am more focused on how bacterial evolve to adapts to the environment (e.g. plant hosts) through experimental evolutionary experiments. Beyond, I have unveiled the microbiome composition and evolution of diverse natural and anthropogenic systems based on shotgun metagenomic and metabarcoding analyses. I have broad experience in diverse methodologies such as microbial isolation, molecular genetics, plants assays, microscopy, phylogenies, or biomolecules purification and identification. However, I feel that my strongest expertise relies on the bioinformatic analyses of multi-omic data. My research allowed me to publish numerous articles, as well as to develop my own ideas as PI of projects (eg: Marie Curie grant) (details on CV).

Overall, I gained broad knowledge into the field of bacterial ecology and evolution. I will merge my acquired scientific and personal skills to pursue a broader and deeper understanding of how bacteria evolve and adapts to the plant environment, by taking advance of the resources and stability that this RyC grant would provide as a starting point of my independent scientific career.

It is known that microbial life adapts to colonize almost every single place of the Earth, including hosts such as animals and plants as well as non-biological niches. This widespread colonization necessitates a process of adaptive evolution. However, to fully understand that adaptation, it is needed to fully comprehend several aspects such as the impact of selection and within-species diversity on evolution.

Comprehending how microorganisms adapt to life in hosts (e.g. plants) could lead not only to understand host-microbe interactions, but also to inspire biotechnological developments for select and/or improve beneficial probiotics. Hence, my future research interest will focus on revealing the processes of bacterial adaptation to the plant environment by pursuing the following objectives:

1.      To provide a better understanding of how plant-beneficial bacteria interact with their hosts to reveal genes or genomic features related with mutualism.
2.      Revealing common bacterial evolution features associated with adaptation to the plant environment.
3.      To turn ecological and evolutionary results into biotechnological innovations

I aim to use cutting-edge methodologies to pursue these objectives. I expect that their outcomes will contribute to a comprehensive understanding of bacterial adaptation to plants and inspire the development of more efficient biofertilizers.

**Resumen del Currículum Vitae:**

I began my PhD journey in 2017 with a predoctoral public contract (Microbiology and Genetics Department, U. of Salamanca), dedicated to isolating and functionally characterizing bacteria from plants and insects. Over the years, my research has evolved from descriptive microbiology to unraveling the evolutionary processes underlying successful host-microbe interactions. Alongside mastering conventional microbiological techniques within my research group, I independently developed robust bioinformatics skills for genomic and transcriptomic data analysis. This self-sufficiency proved crucial during the COVID-19 lockdown, enabling me to conceptualize and lead major aspects of my thesis research. As the main and corresponding author, I steered the publication of articles arising from this work, empowered by the supportive framework provided by my supervisors.

Entering the postdoctoral phase in June 2021 (postdoctoral JCyL contract, followed by a ' Margarita Salas' grant), I carried forward sufficient resources, autonomy, and creativity to initiate my independent research program. With 15 months of international stays, I cultivated a robust network of national and international collaborations, allowing me to conduct research without direct supervision. Although some of that work remains unpublished, I've authored articles as the sole author and in collaboration researchers from diverse institutions. As a proof of my internationalization I have co-authored publications with 47 international researchers affiliated to 31 institutions from 14 countries. Likewise, I have organized international conferences and workshops.

In total, I had time to publish 19 JCR articles (+6 under review), 3 book chapters, 1 book, and several articles in non-JCR journals, being the main and corresponding author in most of them.

As PI of five research projects and one teaching innovation project, I've honed leadership skills in supervising researchers. My experience as PI encompasses contracts with private companies, the study of an unresearched lake environment, and a forthcoming MSCA granted project investigating the skin microbiota's role in chemotherapy-induced skin adverse reactions.

I recently submitted a grant proposal for the ERC-StG call (2023) (under evaluation). In total, I participated in 12 projects funded by publics agencies and 11 by private companies and 11 teaching innovation projects. I also gained 2 small research projects for scientific dissemination. My supervisory roles extend to guiding 3 PhD and 5 Master's students, 10 undergraduate students, and overseeing 2 research stays. I've taken on roles such as the head professor of a Master subject, organized conferences, coordinated scientific seminars, and led or participated in science communication events. I have also participated as coordinator and lecturer of scientific workshops. I am secretary of the quality committee of a PhD program. My overall research and teaching contributions allowed me to get the ANECA accreditation for professor (" profesor contratado doctor").

Recognized by the community, I've served as a reviewer for 22 journals, a guest editor for four journals, and contributed to various national research and academic project evaluations. I've also chaired an international conference and delivered five invited research seminars. My research has awarded me with 5 prizes (e.g. Extraordinary PhD Award, etc.) and grants.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | MARY , BENJAMIN |
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| **Correo Electrónico:** | benjaminmary.pro@gmail.com |
| **Título:** | Research proposal RyC Benjamin Mary |

**Resumen de la Memoria:**

My research has advanced water use efficiency in Mediterranean agriculture while addressing environmental risks associated with irrigation. Concurrently, I have been a proponent of agrogeophysics to address soil health and conservative management practices. I explored innovative approaches to examine plant and tree roots through non-intrusive and cost-effective technologies, essential for mitigating risks and practicing sustainable agriculture. This includes areas like rootstock selection and irrigation scheduling, which are prominent topics, as indicated by numerous past and upcoming national and EU policy programs. I have actively contributed to the progression of agrogeophysics, assuming a leadership role in its establishment. I am now well-prepared to continue to advance this research trajectory within the framework of the Ramón y Cajal prestigious grant. Numerous challenges persist in advancing the incorporation of geophysical studies by diverse scientific communities and decision-makers. Consequently, I aspire to join a precision agriculture (PA) group formed by plant agronomists, ecologists and forest ecosystem specialists with the aim of fostering mutual benefits. My primary goal is to integrate plant remote sensing methodologies (Earth Observations and UAVs) with geophysics within the context of interdisciplinary field research. The PA group stands to gain a valuable asset with the inclusion of geophysics, an often-overlooked discipline within the remote sensing community despite its vital role in soil-plant-atmosphere interactions. It is noteworthy that, to the best of my knowledge, there currently exists no research institute in Spain specializing exclusively in agrogeophysics. This absence underscores the exceptionally innovative nature of pursuing this research trajectory with the following general objectives:

1. Improving water use efficiency in Mediterranean agriculture while minimising the potential environmental risks associated with irrigation.
2. Promote agrogeophysics to raise awareness on the relevance of the management practices for soil health and biodiversity.
3. Enhance a two-way transfer of knowledge between researcher and end-users.

Social and economic expected impact outcomes

I want to emphasize three crucial social and economic impacts: (i) My research line will improve water use efficiency in agriculture through accurate evapotranspiration estimation, enabling optimized irrigation and/or soil conservation practices and increased plant productivity. (ii) Also, by addressing limitations in current models and promoting precision irrigation, the project reduces environmental risks associated with irrigation, such as soil salinization and groundwater depletion, while fostering sustainable land management practices. (iii) Finally, my research should aim at leading to more resilient agricultural communities. It supports food security, aims to preserve local traditions, and promotes economic stability for farmers. (iv) Geophysics extends beyond agronomy, influencing land use planning, and environmental monitoring, promoting biodiversity preservation and sustainable ecosystem management. The findings also raise awareness about biodiversity and water conservation practices.

**Resumen del Currículum Vitae:**

My educational qualifications include a Master of Science in Applied Geophysics from Pierre et Marie Curie (Paris 6) University, received in 2012, and a PhD in Geosciences also from Aix-Marseille University, earned in 2015. With 8 years of postdoctoral experience, I have honed my skills at leading international institutions, in France (INRAE), 5 years at the University of Padua (UNIPD) in Italy, 2 years tenure as a visiting scholar at Berkeley Lab in the USA, 3 months in Belgium (UCLouvain) and later I started a new position at Spanish National Research Council within the Institute of Agricultural Sciences (ICA-CSIC). I delved into pioneering methods for studying plant and tree roots using non-intrusive and cost-effective technologies, crucial for risk mitigation and sustainable agriculture management such as rootstock selection and irrigation scheduling evidenced by the past and upcoming national and EU policy programs. My research, stemming from my PhD on vegetation impact on earth dikes, promotes geophysics for addressing environmental risks in protective levees. Since 2017, I've focused on improving water use efficiency in Mediterranean agriculture, addressing water scarcity, soil health, and management practices. In Italy, I contributed to 7 research projects enhancing research collaboration between Europe and North Africa. I co-supervised the geophysical activities carried out all around the Mediterranean area. I served as the PI of the GROWING MSCA project (Geophysical ROots imaging for Water saVING) a Marie Skłodowska-Curie fellowship. The project developed new tools and services for arboriculture, agronomy, and viticulture, emphasizing emerging monitoring technologies to end-users. In 2020, in mobility to the USA at the Lawrence Berkeley National Laboratory (USA) I extended the scope of my research to long-term and larger-scale studies of plant root interactions with modelling approaches. I participated as an expert in the Biogeophysics for climate resilient viticulture Berkeley-France funds. Since 2019, I'm a committee member of the yearly agrogeophysical seminar. In 2023, I received the Wallonia Brussels International (WBI) Fellowships for adapting my research to address challenges in the growing Belgian wine sector. In October 2023, I joined the Institute of Agronomy Science at ICA-CSIC. In this role, I actively contribute to 3 research projects, where I am responsible for leading the geophysical activities. During all these years. I have participated in one graduate course in the Master of Environmental Engineering at UNIPD. I have national and international experience in mentoring students (1 Msc, 2 BSc, and 3 undergraduates). From 2022 to 2024, I advised the training of 3 PhD students and 1 Postdoc. I have contributed to many outreach activities and have collaborated with the private sector . Over the last 5 years, I participated in field campaigns (>25), in Europe, the South Mediterranean basin and the USA. Since 2020, I am in line with EU recommendations believing that research output must be publicly available and FAIR. My research program includes a total of 18 peer-reviewed scientific articles, all in Q1 Scopus, >75% as the 1st author (14), 30 conferences with proceedings (23 as first author), associated with >330 citations, h-index 10 (Scopus). All my data and codes are published together with peer-reviewed articles.

**Resumen de la Memoria:**

Pascual García Pérez has built a ground-breaking experience in the field of agricultural and food science during the last 10 years. The applicant has been devoted to the study of polyphenols through a multidisciplinary perspective, based on polyphenol metabolomics coupled with computational chemometrics applied to critical milestones of polyphenol research: 1) their production by medicinal plant biofactories through different biotechnological approaches and their implication in crop improvement following biostimulant application; 2) their recovery by industrial by-products and underexploited natural sources, like algae, as well as the description of their bioactivities as health-promoting compounds; and 3) their implications upon consumption considering their bioaccessibility and bioavailability in the human body, inducing the design of functional foods. The results have been assessed by 54 peer-reviewed publications, more than 40 contributions to international conferences, 4 products commercially exploited and/or patented, and the participation in 16 research projects, co-leading 4 industrial agreements. The applicant possesses a wide international experience, as he mainly developed his career in 5 institutions: University of Murcia and University of Vigo in Spain, Mountain Research Center and Research Centre in Biodiversity and Genetic Resources in Portugal, and Catholic University of the Sacred Heart in Italy, where he currently serves as postdoctoral researcher. He also makes part of international networks (GENOPSYSEN, AQUA-CIBUS, and IBERO-CIRCULAR). The applicant led different research, industrial transference, and teaching activities during his career. In 56% of scientific publications, he has contributed as first, corresponding and/or last author, and serves as Editorial Board Member of Frontiers in Plant Science and Horticulturae. His has supervised several predoctoral students, and his research has led to the commercialization of three natural-based biostimulants for crop resilience and the patent of one functional smoothie based on medicinal plants. He has also organized several workshops with stakeholders and general audience for the dissemination of research results and is one of the organizers of the XVII Symposium on Pesticide Chemistry. He is leading the metabolomics research line on the projects PHOBOS and CLIMAL on the metabolomics perspective of crop resilience against climate change. He proposes the research line "METACRONE – METabolomics combined with AI-based computational Chemometrics supporting Regional agriculture and food products for ONE health establishment". It covers a novel approach to provide insight into the valorization of emerging regional agriculture and food systems with the scope of ONE health establishment. The activities proposed include the metabolomic profile of matrices of interest, and their wide bioactive and nutritional assessment. It presents two major objectives: 1) unraveling the impact of novel biostimulants to counter the impact of climate change in regional agricultural systems, by enhancing crop resilience; and 2) deciphering the nutritional properties of novel functional foods based on the recovery of regional industrial by-products, thus diversifying the market, improving industrial sustainability, and promoting human health.

**Resumen del Currículum Vitae:**

Pascual García Pérez, a researcher specialized in plant and food metabolomics, presents a highly international academic background. As a predoctoral researcher, he achieved a national FPU contract and a short-term fellowship awarded by the European Molecular Biology Organization. He disserted his doctoral thesis in 2021 with International Doctorate Mention and cum laude qualification, earning the PhD Extraordinary Award by the University of Vigo. Later, he got a Margarita Salas contract to initiate his postdoctoral career at the Catholic University of the Sacred Heart (Italy), where he currently works as postdoctoral researcher. Pascual's research experience is reflected in 54 peer-reviewed scientific publications and collaborating in a total of 16 research projects. His research has focused on three lines based on the combination of metabolomics with computational chemometrics in the field of polyphenols in agricultural and food science: 1) PLANT POLYPHENOLS, establishing medicinal plant biofactories and describing the mechanism of action of biostimulants; 2) POLYPHENOLS RECOVERY, isolating polyphenols from industrial food by-products and marine algae, leading to industrial sustainability; and 3) FOOD POLYPHENOLS, determining the bioaccessibility of polyphenols in functional foods and their impact in gut microbiota. The impact of his research is reflected by >1000 citations (h-index 20), serving as Editorial Board member for two the journals Frontiers in Plant Science and Horticulturae. Pascual presents a high internationalization profile, as he currently belongs to 3 international research networks, i.e. IBERO-CIRCULAR, AQUA-CIBUS, and GENOPSYSEN. He has participated in the IACOBUS program, and he has served as evaluator for international project calls by CONACYT and CYTED. The research results provided by Pascual's research have motivated their transference to industrial sectors. The interest from the agricultural industry in the exploitation of biostimulants has enabled the commercialization of three biostimulant products, organizing several Academia-Industry Meetings with the involved companies. As well, he led the organization of multiple workshops conducted in collaboration with ADICAM, resulting in an official patent. The knowledge dissemination associated with Pascual's research is also reflected in over 40 contributions in international conferences, leading the organization of the international XVII Symposium on Pesticide Chemistry. Furthermore, Pascual shows teaching experience, at the University of Vigo from 2017 to 2021, where he served as a lecturer for four subjects of Biology and Marine Sciences Degrees, as well as the supervisor of two bachelor's degree thesis and one PhD student. He has directly mentored more than 10 bachelor's and master's students and 5 international PhD students at the Catholic University of the Sacred Heart. Pascual also served as evaluator of PhD dissertation and was officially endorsed by the National Agency for Quality and Accreditation for the positions Assistant Professor, Hired Doctor Professor, and Private University Professor. To sum up, Pascual García Pérez has built a robust research career over the past 10 years in the field of agri-food research, contributing significantly as a teacher, researcher, disseminator, international collaborator, and knowledge transfer facilitator.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
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| **Referencia:** | RYC2023-044223-I |
| **Correo Electrónico:** | jesusvalcarcelbarros@hotmail.com |
| **Título:** | Valorization of fish and seafood by-products |

**Resumen de la Memoria:**

Main research line

My research has focused on the isolation of biomolecules from food matrices. It started in commercial laboratories with the development of methods for vitamin analysis in foods, evolving to the extraction of toxic and health-promoting phytochemicals in potatoes during my PhD, to end in the recovery of biopolymers from fish by-products through valorization processes in my postdoctoral stage.

Research Career

My research career starts in the industry shortly after obtaining my degree in Chemistry. Firstly, by developing methods of food analysis at the Food Chemistry Department of LGC (UK) in the framework of projects granted by the British Government, as the laboratory was the UK National Reference Laboratory for Food analysis.

After a brief interim in R&D of consumer products at Zelnova Zeltia, I moved to Ireland to start a PhD in 2009 in Food Science and Technology under the supervision of Kim Reilly (Teagasc), Michael Gaffney (Teagasc), and Nora O′Brien (University College Cork). In 2014 I defended my thesis entitled ′Profiling phytochemical and nutritional components of potato′. The document analyses how genotype, agronomical and climatic factors influence the accumulation of polyphenols, carotenoids, vitamin C, and glycoalkaloids in the flesh and skin of 60 varieties of potato. In the last case, the work was recognized by the EFSA as the most comprehensive profiling to date of glycoalkaloids.

During my PhD, I ascertained that in many cases potato skin was richer in phytochemicals than the flesh, but was generally discarded as waste. I thus developed an interest in recovering biomolecules from food bioproducts, which led me to join the Recycling and Valorization Group at the Marine Research Institute (IIM-CSIC) as a. During this time, I have mostly concentrated on biopolymers, learning from the optimization of the extraction process to advanced characterization techniques such as gel permeation chromatography and NMR. Last year I had the opportunity to access singular facilities such as the ALBA synchrotron to characterize fish gelatin, thanks to the funding I obtained as co-IP of a proposal to access beam time. As a result, I have published 39 SCI articles on the valorization and applications of chitosan from shrimp and squid, chondroitin sulfate from cartilaginous fish, hyaluronic acid, gelatin from fish skin and fish protein hydrolysates.

Throughout my postdoctoral stage, I have participated in three European projects, which has facilitated the establishment of international collaborations. In this framework, I realized that for many applications the biomolecules recovered needed chemical modifications to suit the intended purpose. Hence, I started this new research line by developing an empiric model to produce chitosan, chondroitin sulfate and hyaluronic acid of the desired molecular weight through enzymatic and acid hydrolysis. I have also transferred knowledge to the industry through my participation in a CDTI project with Conservas Rianxeira, allowing me to contribute to the expansion of the valorization processes currently in place in Rianxeira's subsidiary Valora Marine Ingredients to produce chondroitin sulfate from blue shark head, as well as to add value to cooking waters from cephalopods and mussels.

**Resumen del Currículum Vitae:**

SCIENTIFIC AND TECHNICAL CONTRIBUTIONS
- 50 SCI publications: First author in 11 (22%), last in 11 (22%) and corresponding in 14 (28%); 14 in D1 (28%), and 33 in Q1 (66%).
- H-index: 18 (Google Scholar), 16 (Scopus), 16 (WoS).
- Total citations: 823 (Scopus), 724 (WoS), 995 (Google Scholar).
- 2 book chapters.
- 17 congress contributions: 14 international, 3 oral.
- Knowledge transfer: Participation in a CDTI project with Rianxeira S.A.
- Outreach: videos and activities in primary schools.

MOBILITY AND INTERNATIONALIZATION
- 48 months in Ireland in my predoctoral stage (University College Cork and Teagasc Ashtown Food Research Centre – Dublin).
- 14 months in the industry in the UK (LGC Ltd.) in my predoctoral stage developing methods of chromatographic analysis.
- Participation in 3 international research projects (EU funded) and 2 national projects in Ireland and the UK.
- 37 SCI publications with international collaborators: 4 during my PhD and 33 as a post-doc.
- 14 international congress contributions and 2 book chapters with international authors.

LEADERSHIP AND INDEPENDENCE
- Co-IP of a funded project to carry out measurements at ALBA synchrotron (24,000 €).
- Independent authorship: First author in 11 publications (22%), last in 11 (22%) and corresponding in 14 (28%).
- Supervisor of 1 TFG project and 3 intern students.
- Editor of the Special Issue "Marine biomolecules from food by-products; chitosan and gelatin" in the journal Polymers (IF 4.3, Q1) and regular reviewer of several SCI Journals.

- Evaluator of projects for SPI-FONDECYT (Chile).
- Passed all phases of a tenured scientist position at CSIC (2022).

My scientific contributions have focused on isolating and characterizing biomolecules from agricultural products and by-products of the fishing industry, with biological activities relevant in medicine and the food industry. As a postdoc, I have gained experience in the optimal extraction of biopolymers from marine organisms (chitin, chitosan, chondroitin sulfate, and gelatin) and in their characterization by chromatography and NMR. My participation in three international projects has allowed me to establish inter-disciplinary collaborations with other groups, resulting in 33 research papers, joint participation in 12 conferences, and co-supervision of a BSc student project. I have also obtained competitive funding to in-depth characterise fish gelatin at ALBA synchrotron as co-IP with researchers form other national and international institutions.

My contributions to society have materialized in the transfer of knowledge to the industry and participation in outreach activities. In the first case, my participation in a CDTI project with Conservas Rianxeira has allowed me to contribute to the expansion of the valorization processes currently in place in Rianxeira to produce chondroitin sulfate, ceramides, and protein hydrolysates from remaining meat from blue shark heads, and flavouring agents and glycogen from cooking waters of cephalopods and mussels. In the second case, I have participated on three occasions on scientific activities in primary schools and produced a video about COVID transmission during the pandemic.

Other contributions include supervision of a BSc student, whose work was part of a publication in Carbohydrate Polymers, and three intern students, editorial work for a Special Issue in Polymers (MDPI), and project evaluation for SPI-FONDECYT (Chile).

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | GARCÍA RUIZ, ALMUDENA |
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| **Correo Electrónico:** | almugaru@protonmail.com |
| **Título:** | Almudena Garcia Ruiz |

**Resumen de la Memoria:**

Dr. García-Ruiz holds a Ph.D. in Food Science and Technology and Chemical Engineering from the Autonomous University of Madrid. During her predoctoral period (January 2007 - June 2012), her research focused on oenological microbiology. Specifically, her main research lines were: i) the effect of polyphenols on the growth and metabolism of oenological bacteria and their potential use as an alternative to the use of sulfites in winemaking, ii) the evaluation of new antimicrobial agents in winemaking from lysozyme, milk-derived peptides, dry inactive yeast preparations and bacteriocins, and iii) the minimization of the presence of biogenic amines in wines, with special emphasis on their degradation. It has also collaborated with the industry.

Her postdoctoral period could be divided into four phases. In the first one, she continued to work at the CIAL-CSIC-UAM (July 2012 - December 2013). During this period, her research continued to focus on the field of oenological microbiology: i) characterization of lactic acid bacterial strains, ii) evaluation of silver nanoparticles as a new antimicrobial in winemaking, and iii) evaluation of the probiotic potential of LAB of oenological origin (the first scientific project directed by Dr. García-Ruiz). Subsequently, she worked at the Escuela Politécnica Nacional (Ecuador) (July 2014 - November). During this period, she led two scientific projects focused on the extraction of functional ingredients from quinoa and fruits native to Ecuador, as well as the analysis of the phenolic fraction and antioxidant activity of new varieties of Ecuadorian cocoa. As a result of this research, she was the first to characterize the phenolic and carotenoid composition, together with the antioxidant capacity, of the native flora of South America, such as guayusa. During this period, she participated in two international projects (COOPB20125 and 112RT0460-CORNUCOPIA) and established collaborations with CEBAS-CSIC (Spain) and the University of Seville (Spain), which were essential for the success of her research. She also collaborated and developed a short stay with Daniel Barrio Lab (Univ. Nacional de Río Negro, Argentina) to evaluate the toxicity and antioxidant capacity in vivo, through a zebrafish model, of Ecuadorian fruits. She collaborated with Univ. Ambato (Ecuador). It also collaborated with the RUNA Foundation. In the third period (Jan 2018-Dec 2021), she joined IMDEA Food (Spain) and Salk Institute for Biological Studies (USA) through a MSCA-IF-GF. She has been the PI of two scientific projects. One of them evaluates the potential of small open reading frames (smORF) as new modulators of disorders of dietary excess, focusing mainly on those that influence lipid metabolism. Regarding the second one, she evaluates the regulation of the gut microbiota by the transfer of host and dietary miRNAs, and the function of dietary exosomes and exosome mimetics in this cross-kingdom. She is currently a postdoctoral researcher at Grup de Recerca Nutrigenomica URV (Tarragona, Spain). Her work is mainly focused on technology transfer. Her investigations are focused on the search for bioactive peptides with antihypertensive and anti-glycemic effects from agro-food plant by-products, and on the generation of hydrolysates with antimicrobial properties from biowastes for their use in animal feed.

**Resumen del Currículum Vitae:**

Dr. García-Ruiz holds a Ph.D. in Food Science and Technology from the Autonomous University of Madrid. Her research career reflects the multidisciplinary character of her investigations in the field of food science. She has worked on numerous projects on different research topics. Her predoctoral research was focused on the field of enological microbiology. In particular, her investigations, in vitro and in winemaking, showed the potential application of phenolic compounds as antimicrobial additives in enology. She also demonstrated in vitro the antimicrobial activity of lysozyme, milk-derived peptides, dry inactive yeast preparations, and bacteriocins against lactic acid bacteria (LAB). On the other hand, she has also worked on the production of biogenic amines by LAB and the degradation of biogenic amines by vineyard ecosystem fungi and LAB.

Her postdoctoral period can be divided into four stages. The first one was at the CIALCSIC-UAM. During this period, her research was focused on the field of enological microbiology, where she reported for the first time the probiotic potential of oenological LAB (the first scientific project of Dr. García-Ruiz). Afterward, she worked at the Escuela Politécnica Nacional (Ecuador), where she characterized the phenolic and carotenoid composition as well as the antioxidant capacity of Ecuadorian flora to demonstrate the potential applicability of these fruits as functional ingredients in the food industry. She led 2 projects and established an excellent network between groups from Spain and South America. In her third postdoctoral period, she joined IMDEA Food (Spain) through AMAROUT II Fellowship Actions and later the Salk Institute for Biological Studies (USA) through an MSCA-IF-GF, starting a collaboration between both institutions. Currently, she is involved in projects related to miRNAs-diet and leads 2 projects focused on 1) evaluating the potential of microproteins as novel modulators of disorders of dietary excess; and 2) evaluating the regulation of gut microbiota by the transfer of host and dietary miRNAs and the function of exosomes in this cross-kingdom. She is currently working as a postdoctoral researcher at the Grup de Recerca Nutrigenomica URV (Tarragona, Spain). Her work is mainly focused on the search for bioactive peptides with antihypertensive and anti-glycemic effects from agro-food plant by-products. I'm collaborating with the industry to develop this project, mainly with Pharmalink SL. This last period is more focused on technology transfer.

Dr. García-Ruiz's research work as a whole reflects a total of 42 published papers (19 as the first author, 3 as the last author, and 4 as the corresponding author), 29 in SCI journals (26 in Q1, 17 of them D1, h-index=19), 2 patents (1 International), 40 conferences, 1 book, 2 book chapters, and 2 awards. She has supervised 1 doctoral thesis, 2 TFM, and 4 TFG. She has also carried out teaching activities. Finally, she has been an evaluator of scientific projects for the governments of Ecuador, Croatia, Spain, the European Commission, and Argentina and is a referee of several SCI journals.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | GIL CORTIELLA, MARIONA H |
| **Referencia:** | RYC2023-043484-I |
| **Correo Electrónico:** | marionagilicortiella@gmail.com |
| **Título:** | Investigación y desarrollo en vitivinicultura y tecnología enológica |

**Resumen de la Memoria:**

La postulante realizó su tesis doctoral (2013) en el Departamento de Bioquímica y Biotecnología de la Facultad de Enología de la Universitat Rovira i Virgili (Tarragona, España), concretamente en el Grupo de Tecnología Enológica (TECNENOL), bajo la dirección de los Doctores Joan Miquel Canals y Fernando Zamora. Durante la etapa predoctoral, la postulante se capacitó para poder realizar investigación de calidad en el área de la enología y la vitivinicultura, desde el diseño de ensayos, los tratamientos en campo, la realización de microvinificaciones y vinificaciones a escala piloto, así como la implementación de métodos de análisis instrumental para caracterizar las muestras procedentes de los ensayos, y el análisis y discusión de los resultados.

Mediante las capacidades adquiridas durante la etapa predoctoral, la postulante adjudicó (2014) un proyecto postdoctoral (FONDECYT 3150322), convocado por la Comisión Nacional de Investigación Científica y Tecnológica (CONICYT, actualmente ANID) del Gobierno de Chile. Dicho proyecto se ejecutó en el Departamento de Agroindustria y Enología de la Facultad de Ciencias Agronómicas de la Universidad de Chile, bajo el patrocinio del Dr. Álvaro Peña-Neira. Durante esta etapa postdoctoral, la postulante se incorpora al Grupo de Investigación Enológica de la Universidad de Chile, donde tiene la oportunidad de complementar su formación en el área de la viticultura y la fisiología vegetal, así como adquirir experiencia en la ejecución de proyectos de investigación, incluyendo la gestión presupuestaria, y la rendición académica y económica. Del mismo modo, durante esta etapa postdoctoral, la postulante establece colaboraciones nacionales (Chile) con otros investigadores del área, que se materializan en forma de co-investigaciones en varios proyectos de investigación y coautorías en publicaciones científicas.

Finalizado el proyecto postdoctoral, la postulante se incorpora a tiempo completo como profesor asistente al Instituto de Ciencias Químicas Aplicadas de la Facultad de Ingeniería de la Universidad Autónoma de Chile (2017), donde consigue estabilizarse como académico docente-investigador, ahondando en las relaciones nacionales previas (Chile) y estableciendo relaciones internacionales mediante la ejecución de proyectos para dicho fin, adjudicados en concursos competitivos. Durante este periodo, la postulante sigue con su vinculación al Grupo de Investigación Enológica de la Universidad de Chile, desarrollando ensayos relacionados con las implicaciones químicas y sensoriales del uso de distintas prácticas vitivinícolas durante la elaboración de vinos blancos, tintos y espumosos. Durante este período, la postulante acumula horas de experiencia docente, así como en la ejecución de proyectos de investigación. Adicionalmente a su línea principal relacionada con la enología y la vitivinicultura, la postulante es uno de los miembros fundadores del Laboratorio Multidisciplinar de Investigación en Agroindustria de la Universidad Autónoma de Chile, grupo en el que se encarga de la caracterización fisicoquímica y sensorial de distintos frutos procedentes de ensayos enfocados al estudio del proceso de maduración y la utilización de prácticas agrícolas bioamigables. Recientemente (2023) la postulante ha ascendido en la jerarquía de su institución, pasando a profesor asociado en la Universidad Autónoma de Chile.

**Resumen del Currículum Vitae:**

La postulante desarrolló su Tesis Doctoral en el Grupo de Investigación en Tecnología Enológica de la Universitat Rovira i Virgili (Tarragona, España), donde inició su carrera investigadora desarrollando la tesis doctoral "Influencia de la madurez de la uva y de ciertas prácticas vitivinícolas sobre el color, los compuestos fenólicos y los polisacáridos del vino tinto", que originó cinco publicaciones científicas en revistas indexadas. Esta línea de investigación original enfocada a establecer las consecuencias fisicoquímicas y sensoriales de la aplicación de distintas prácticas vitícolas y/o enológicas durante la elaboración del vino tinto, sigue siendo una de las líneas principales de la investigadora, aunque su ámbito de interés no se limita a la caracterización de vinos tintos, ya que ha realizado también varios trabajos relacionados con la elaboración de vinos blancos y de vinos espumantes.

Dentro de la línea principal en el área de la tecnología enológica, la postulante ha desarrollado distintos trabajos relacionados con el uso de distintas cepas de levadura, ya sea mediante el uso de mono-inoculación como mediante el uso combinado de distintas cepas aplicando inoculaciones secuenciales. Adicionalmente, también cuenta con distintos trabajos relacionados con la utilización de productos derivados de levaduras como coadyuvantes o aditivos, que en general han implicado la colaboración público-privada con empresas proveedoras de insumos enológicos. Una de las líneas desarrolladas recientemente está relacionada con el uso de depósitos alternativos a los convencionales durante la elaboración y la guarda de los vinos, analizando el efecto de la forma y el material de los depósitos sobre las características fisicoquímicas y sensoriales de los vinos resultantes, que ha generado, hasta la fecha, tres publicaciones en revistas indexadas y más de 5 piezas o artículos de divulgación en revistas especializadas del sector en distintos países. En la actualidad, la postulante está ejecutando como investigadora principal dos proyectos en el área enológica: un proyecto de investigación básica sobre la inestabilidad cálcica de los vinos, y un proyecto de investigación aplicada -que debería generar productos susceptibles de generar propiedad intelectual- enfocado en la fabricación y validación de un carbón activado que permita mitigar el ahumado de los vinos (smoke taint) que aparece cuando las uvas han sido expuestas al humo de incendios forestales durante su etapa de maduración.

Durante los últimos años, además, la postulante ha tenido la oportunidad de participar en equipos multidisciplinares de investigadores e incursionar sobre la caracterización fisicoquímica de frutas-bayas, tales como la uva de mesa, la fresa, las moras, las murtillas o los arándanos. Estos trabajos colaborativos han permitido a la investigadora postulante iniciar una línea de investigación secundaria, y participar en proyectos enfocados a la aplicación de técnicas agrícolas eco-amigables, la remediación de suelos contaminados y la utilización eficiente del agua para usos agrícolas, lo que sin duda podría acabar generando soluciones de interés para la sociedad en el contexto actual de cambio climático.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | SILES  MARTOS, JOSÉ ANTONIO |
| **Referencia:** | RYC2023-044125-I |
| **Correo Electrónico:** | josesimartos@gmail.com |
| **Título:** | Linking soil microbial communities, land use, and organic amendments for a sustainable agriculture. |

**Resumen de la Memoria:**

Soils deliver crucial ecosystem services such as the provision of food, carbon sequestration, water purification, and degradation of contaminants. For providing these services, soils depend on the microorganisms that inhabit them. Because of this, I am a soil scientist interested in the study of soil microbiomes and its role in ecosystem functioning in contaminated, natural, and agricultural lands. In the current context of moving towards a more circular economy, my research also focuses on investigating viable strategies of transforming wastes into soil organic amendments and fertilizers. My research ultimately aims at generating knowledge to develop sustainable strategies for land use in agroecosystems.

During my PhD (2009-2014), I characterized the process of bioremediation of olive oil mill residues by fungi and studied the effect of the application of these bioremediated wastes on nutrient contents and microbial communities of Mediterranean agricultural soils. I studied soil microbial communities from a multidisciplinary perspective by integrating biochemical techniques, culturomics, and metataxonomics.

My first postdoc stage (2014-2018) took place at the University of Innsbruck (Austria), where I elucidated how the changing environmental conditions related to elevational, seasonal, and interannual variability drive soil organic matter composition and microbial diversity of forest soils from the Italian Alps.

I conducted a second postdoc (2018-2020) at the University of California at Berkeley (CA, USA), where I worked in a project aiming at developing and implementing a bioremediation plan for a petroleum-hydrocarbon contaminated site of the San Francisco Bay Area and developed my own research line. This line included the study of the resilience of soil microbes to contamination and the coupling of culturomics and metataxonomics to better characterize microbial communities of long-term contaminated ecosystems and to isolate bacteria of biotechnological interest.

In 2020, I returned to Spain after being awarded with a "Juan de la Cierva-Incorporación" (JdC-I) contract to conduct a third postdoc (2020-2023) at CEBAS-CSIC (Murcia). During this period, I started a new research line in my hosting group on microbial aspects of soil phosphorus and carbon cycling. My research also focused on elucidating patterns of soil microbial communities under gradients of land use for modelling purposes to develop more sustainable agroecosystems and on the revalorization of wastes into amendments to improve soil fertility. After finishing my JdC-I contract, I have continued as a postdoc researcher in the same research group to work in the context of several projects and to dig deeper into the research lines I started to develop during my JdC-I stage.

If I am awarded with a "Ramón y Cajal" contract, I will continue my scientific career by getting a better understanding of the following aspects of my current research lines: i) elucidating the most important aspect (diversity, activity, or abundance) of soil microbial communities to sustain a higher land productivity to be prioritized for soil conservation policies; ii) understanding the role of  soil microbial rare biosphere in soil functioning in agrosystems; and iii) finding new phosphorus fertilization strategies based on organic wastes and the use of bacteria involved in phosphorus cycling.

**Resumen del Currículum Vitae:**

I hold a Bachelor's Degree in Biology (2009) and a Master's Degree in Advances and Research in Microbiology (2009) from the University of Granada. My scientific career started in 2008 after obtaining a JAE-Intro fellowship from the CSIC to work at EEZ-CSIC (Granada). In 2009, I was awarded with a competitive JAE-Predoc grant to conduct my PhD also at EEZ-CSIC on microbial ecology of soils amended with bioremediated residues of the olive oil industry. I successfully defended my PhD thesis in 2014 after publishing 1 book chapter and 5 SCI articles as a first and corresponding author. During my PhD, I conducted 1 national (Medina Foundation, Granada) and 2 international stays (Academy of Sciences, Czech Republic, 4 months; Michigan State University, USA, 3 months).

I have almost 6 years (69 months) of postdoctoral experience abroad. I conducted a first postdoc (2014-2018) at the University of Innsbruck (Austria) on soil microbial ecology across environmental gradients in forests from the Italian Alps. My second postdoc (2018-2020) took place at the University of California at Berkeley (USA). During his period, I worked on soil microbial ecology of contaminated environments and bioremediation. In 2020, I returned to Spain after being awarded with a "Juan de la Cierva-Incorporación" (JdC-I, 2020-2023) to conduct a third postdoc at CEBAS-CSIC (Murcia). My research focused on land use, soil microbiomes, nutrient cycling, and waste revalorization into soil fertilizers. Right now, I am a postdoc researcher in the frame of several projects on the research lines I developed during my JdC-I stage.

In total, I have participated in 8 national (including 4 "Plan Nacional", 1 "Transición Ecológica", and 1 i-LINK+), 2 European (1 H2020-EJP Soil and 1 EU-LIFE) and 3 international (2 in Austria and 1 in USA) research projects, and 2 contracts with private entities (65,645€). Additionally, I am a PI/co-PI of 4 research contracts with private companies (55,320€) and co-inventor of 1 patent. I also managed as a PI the research budget (6,000€) associated to my JdC-I contract. I have published 33 SCI articles, 20 of them (60%) as a first author and 11 (33%) as a corresponding author. 23 (70%) of my articles are published in Q1 journals. I have also published 4 book chapters as a first author. My publications accumulate 1,272 (Google Scholar)/1,016 (Scopus) cites and my h-index is 18/16. I have 22 contributions to 12 international and 5 national conferences. As a first author, I have 12 posters and 2 talks. I have given international invited seminars (University of Copenhagen and UC Berkeley). During my postdoc at the University of Innsbruck, I taught 6 ECTS in undergraduate microbiology courses. I have trained several technicians and undergraduate students. Furthermore, I have supervised 2 (1 ongoing) bachelor's theses (TFG) and 2 (1 ongoing) master's theses (TFM), and I am supervising 1 PhD thesis. I am an Associate Editor in Frontiers in Soil Science and an Editorial Board member in Applied Soil Ecology. I have edited one special issue for Microorganisms and another one for Frontiers

in Microbiology. I have reviewed articles for more than 25 SCI journals. Across my career, I have actively participated in different events of science divulgation and have written dissemination articles, and my research has been covered by different magazines.

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| **Área Temática:** | Ciencias agrarias y agroalimentarias |
| **Nombre:** | ROBLES AGUILAR, ANA ALEJANDRA |
| **Referencia:** | RYC2023-045707-I |
| **Correo Electrónico:** | ana.robles@uvic.cat |
| **Título:** | Enhancing the sustainability of farming systems using Biobased Fertilisers and innovative Nutrient Management practices |

**Resumen de la Memoria:**

I have dedicated my career to addressing the crucial challenge of maintaining crop productivity while mitigating environmental pollution generated by agricultural systems, mainly focusing on the efficient use of biobased fertilisers. The main findings during my early career in Germany at the Forschungzentrum Julich and later at the Bioeconomy Sciences Centre led to a deeper understanding of plant traits that have a significant effect on the nutrient availability from biobased fertilisers, with a specific emphasis on those boosting P availability. During my PhD, I identified the potential of plant phenotyping for quantitative analysis of plant structures and functions, including non-invasive measurements of the slow-release properties of struvite over time or the visualisation of the rhizosphere processes via chemical imaging using optical pH sensors. I also explored novel crop management practices, such as leveraging native legume species to mobilise nutrients, an experience I gained during my research stay at the University of Western Australia. My PhD studies resulted in 8 peer-reviewed publications showcasing significant findings, including the demonstration that high exudative plant species can enhance nutrient mobilisation from recovered P-sources or emphasising the importance of analysing the microbial community, revealing that plant species, rather than the applied fertiliser, can influence the microbial abundance and diversity in the rhizosphere.

Later in my career, as a senior researcher at the Resource lab (Ghent University, Belgium), I expanded my research beyond P to investigate N and C dynamics from recovered products. I delved into the effect of biobased fertilisers on soil chemical properties, but also their environmental impact, economic feasibility, and the legal barriers to their implementation. I also studied the recovery of N products such as ammonium nitrate or ammonia-water obtained from further processing of the liquid fraction of digestate using innovative technologies such as N-stripping, evaporation, or membrane filtration. As a result, I co-authored 12 papers and was invited to participate in 2 book chapters, covering aspects such as the dynamics of N-cycling-related genes following the application of biobased fertilisers or the effect of vegetation on the mineralisation patterns of biobased fertilisers.

In 2022, I joined the Institut of Agrifood Research and Technology (IRTA), Spain, as a senior scientist collaborating on the Circular Agronomic EU-funded project. The project aimed to tackle the environmental challenges of using organic and biobased fertilisers, such as greenhouse gases or ammonium emissions. Thus, within the Biosystem sustainability team, I gained a strong knowledge of measuring and minimising gas emissions and co-authored a book chapter with the team. Since November 2022, I have gained a senior researcher position in the carbon and nutrient management group at BETA Technological Center, Spain. Within my current role, I commit to demonstrating that sustainable nutrient practices can provide concrete solutions to the ambitious goal set by the European Commission (as part of the Farm to Fork strategy) to address the environmental challenges posed by fertiliser production and use: to reduce nutrient losses of at least 50% by 2030 while ensuring no deterioration in soil fertility.

**Resumen del Currículum Vitae:**

In total, my research has resulted in 22 peer-reviewed publications in international journals (citations: 319; h-index: 11), 3 book chapters and 3 conference proceedings. I have disseminated my knowledge to the scientific community through 35 scientific communications, with 5 keynotes, 20 oral communications, and 13 posters at national and international conferences. I have organised various national and international workshops and participated in other educational outreach activities, e.g., with high school students. I have co-organised 5 nutrient-related scientific conferences and been part of the scientific committee in 2 of them. I have also organised 2 summer schools and one webinar series on the topic of Bioresource recovery, as well as one-week training within a Marie-Curie ITN for 15 PhD students.

I have co-developed several successful grants, participated in more than 10 EU and national research projects, and assumed leading roles as a scientific coordinator or work package leader in 5 of them. I am also engaged in several technology transfer projects with relevant companies from the agri-food sector. Notably, I gained an R&D project funded by the international fertiliser company ICL, titled "Evaluation of the HTC technology implementation and hydrochar production from livestock manure in Catalonia," where I serve as the Principal Investigator. Throughout my international and interdisciplinary research, I have directly worked with teams from Germany, Australia, Belgium, and Spain, having publications with more than 70 different co-authors from more than 40 institutions.

My commitment to mentorship is highlighted through the co-direction and supervision of 9 PhD students, 2 MSc, and the mentoring of several trainees. I have also been on 2 PhD and 2 MSc examination committees and act as a reviewer of several scientific journals. Beyond the research activities, I have been the coordinator of the international thematic network Resource.bio, facilitating joint PhDs agreements between Ghent and international universities. I am also member of the steering committee of the ESNI community, which is part of the Biorefine Cluster Europe, where we organise a series of technical webinars and conferences, with the participation of the EU commissions, the private sector and the scientific community to discuss challenges related to the production and uptake of alternative fertilisers.I have participated in several outreach events in close collaboration with the European Sustainable Phosphorus Platform (ESPP), with contributions from industries, public entities, and other relevant stakeholders in the biobased fertilisers sector. This expertise has led me to submit a COST Action on sustainable nutrient management, which will be resolved in 2024 and from which I am the chair.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | RAMÍREZ CUESTA, JUAN MIGUEL |
| **Referencia:** | RYC2023-045589-I |
| **Correo Electrónico:** | ramirezcuesta.jm@gmail.com |
| **Título:** | Sustainable water management in agrosystems by using remote and proximal sensing technologies |

**Resumen de la Memoria:**

Dr. Ramírez-Cuesta has 11 years of experience (2012-23) in the field of proximal and remote sensing research focused on the conservation and efficient water management in agroecosystems. He is currently a fixed-term assistant professor at the DI3A of the UniCT (Italy) and a "Doctor Vinculado" to the CIDE-CSIC. His research line focuses on the study and evaluation of agricultural systems and mainly on the agricultural water management through computer technologies, sensors, precision management of agricultural systems and the modelling of their related processes. This methodological approach includes the use and development of techniques based on data acquired through remote and proximal sensors (e.g. multispectral, hyperspectral, radar and thermal information) on board satellites, aircraft and drones; and through on-ground sensors; all of them also applied in a geographic information system (GIS) environment. More specifically, his work focuses on estimating the crop water requirements and evaluating their water status by proximal and remote sensors based models (e.g., surface energy models and soil water balance models). The applicant has acquired funding for the development of his research career by obtaining contracts in national and international competitive calls, including (i) a FPI-INIA contract to carry out his international doctoral thesis on the use of remote sensing for improving irrigation management (on November 2018, Outstanding cum laude) at IFAPA, Córdoba; (ii) a Juan de la Cierva (JdC) - Formación postdoctoral contract at the CEBAS-CSIC; (iii) a "Plan Propio" postdoctoral contract at the UCLM (1/23 in the area of Sciences; 97.18/100.00 points); (iv) a JdC - Incorporación contract at the CIDE-CSIC (1/128 in the area of Agricultural and Agri-Food Sciences; 99.20/100.00 points); and (v) a post-doctoral competitive contract at the UniCT. From Nov-2016 to Jul-2019 he was hired as a researcher within the framework of an International project (JPI-Water IRIDA).

**Resumen del Currículum Vitae:**

The applicant is co-author of 52 scientific contributions during the period 2015-2024 (including, 35 indexed articles, 9 articles in international journals with peer review, 6 articles in dissemination journals and 2 book chapters). Of the 35 indexed scientific articles, 26 of them (75%) are Q1, and, of them, 12 (46%) are D1. In 54% of them he acted as "First", "Senior" or "Corresponding Author". These documents have received 502 citations from 413 different sources, resulting in a Hirsch (H) index of 15. He has played/is playing the role of Principal Investigator of 3 national/regional projects and 4 contracts with private companies/ public entities. He has participated in 21 research projects (9 International and 12 National/Regional), in 5 research contracts with private companies, as well as in the organization of 2 R&D activities. He has given 8 internationally recognized invited talks and presented 40 scientific contributions at international (n. 25) and national (n. 15) congresses. His research career has been developed at 4 Spanish research institutions (IFAPA; CEBAS-CSIC, UCLM and CIDE-CSIC) and at one international university (UniCT). The applicant has also performed research stays at 4 international research centres in order to enrich his training (University of Davis-California and University of Lincoln-Nebraska in United States, and UniCT and CREA-OFA in Italy) and 2 short stays at national research centres (IAS-CSIC and IVIA). The applicant is co-author of 2 registered industrial patents and 2 open source models. He is Associate Editor of Irrigation Science journal (Springer, Q1); and Topic Editor of Remote Sensing journal (MDPI, Q1). He is currently editing a Special Issue in Irrigation Science journal entitled "Recent Advances on water management using UAV technology"; and he has acted as Guest Editor of 3 Special Issues on Agronomy, Water, and Atmosphere journals. In addition, the applicant has been part of the Body of Knowledge – Water Scarcity Expert Group 2022. He has mentored 4 international MSc Thesis in Italy (UniCT, Università degli Studi di Bari Aldo Moro and Università degli Studi di Palermo). He has co-tutored a doctoral thesis in Italy (UniCT) and he is currently mentoring another three doctoral thesis at Mohammed I University (Morocco), at UniCT; and at Universitat Politècnica de València. As result of his academic record and scientific career, he obtained 6 academic awards, highlighting: (i) the 2022 Best Paper in the Journal of Irrigation and Drainage Engineering awarded by the EWRI, ASCE; (ii) the Best Conference Paper award of the 2023 IEEE International Workshop on MetroAgriFor; and (iii) the Best Communication of the section "Agronomic applications, GIS, APPS and ICT" in the III National Symposium of Horticultural Engineering; and 3 awards for the outstanding grades obtained in his university education. He has organized and actively taken part in numerous scientific divulgation events and outreach technological development and innovation activities designed for different end-users (students, researchers, farmers, and agricultural experts from the private sector, public institutions and citizens) aimed at promoting knowledge about the optimal water management for irrigated agriculture. In this sense, he has taken part at media interviews and in several scientific dissemination events.

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | PAREDES LLANES, DANIEL |
| **Referencia:** | RYC2023-044855-I |
| **Correo Electrónico:** | drparedesd@gmail.com |
| **Título:** | Sustainable pest control |

## Resumen de la Memoria:

My research interests revolve around developing innovative methods to harmonize food production with the conservation of ecosystem services and biodiversity. Specifically, I am dedicated to advancing sustainable pest control approaches through the promotion of biodiversity, particularly within integrated and organic agricultural production contexts.

Throughout my career, I have collaborated with numerous experts globally, especially in Portugal, the USA, and Austria, continuously contributing my skills in data science and landscape analysis. Initially, I employed traditional approaches to study sustainable management strategies for delivering ecosystem services in agricultural landscapes. This research has demonstrated that the combination of natural ground cover and adjacent vegetation has a positive influence on olive abundance and the diversity of natural enemies, significantly contributing to pest control. This innovative approach considered the interaction of ecological infrastructures, making a substantial contribution to the field of agroecology. Building on the results of this first stage of my career, I conducted a project as PI to evaluate the impact of natural habitat patches at the landscape scale on reducing damage caused by olive pests which was set at 185€/ha.

However, I have transitioned to ecoinformatic methods, utilizing substantial big datasets from governmental institutions. This "big data" initiative delved into the impact of landscape on pest control and pesticide application and the effect of pest population variability on extreme pest outbreaks. This undertaking underscored the significance of employing ecoinformatic methods to uncover enduring effects often concealed by the unpredictable nature of agricultural systems. This collaborative initiative has enhanced my skills in managing and analyzing vast temporal and spatial databases essential for efficient natural resource management. It has also enabled me to engage in pioneering projects, exemplified by my contribution to a publication in the journal Science.

My proficiency in computational skills is evident in my utilization of Agent-Based Models to comprehend the effects of changes in landscape structure and agricultural practices on the population size, distribution, and interactions of arthropod pests and their natural enemies. Concurrently, I serve as an expert in terrestrial arthropod ecology and population dynamics for the European Food Safety Authority (EFSA). In this role, I am developing an algorithm to establish measurable connections between the direct impacts of plant protection products, specifically insecticides, on non-target arthropods and pollinators at landscape scales. Additionally, I have undertaken various contracts with companies to explore the impacts of emerging energy land uses, such as expansive photovoltaic energy plants, on agricultural ecosystem services.

Looking ahead to my independent career, my focus will be on investigating how climate and land use changes will influence future pest outbreaks and related parameters, with a particular emphasis on understanding the consequences of these changes on pesticide use.

## Resumen del Currículum Vitae:

My research focuses on developing sustainable pest control methods in integrated and organic agricultural settings. Specializing in entomology, landscape modeling, ecoinformatics, and data science, I employ predictive models and simulations as my main tools. During my PhD, I earned the prestigious "Núñez de Prado for Organic Farming Research" prize and an accompanying €6,000 award. I also received a scientific outreach award for my PIIISA project contribution. I produced 5 papers on this stage.

In my first postdoc, collaborating with Stanford University, we evaluated natural habitat effects on olive biocontrol at the landscape scale, quantifying this service at around 185 €/ha. Self-raised funds supported this project, and I secured funds for another project in Vienna. Acting as a statistical supervisor for VineDivers, I published seven JCR journal articles and co-led the successful proposal submission for the BiodivERsA program. Our project SECBIVIT was granted, leading to my move to California in 2019. However, before my USA enterprise, I was hired as a postdoc at the University of Coimbra. We still have a strong collaboration as we're developing three EFSA-funded projects assessing the environmental risks of plant protection products on non-target arthropods at the landscape scale of which I am coPI. Outreach activities include a video highlighting landscape effects on olive pests, and I am teaching at the International Master in Applied Ecology.

In my third postdoc at UC Davis, I researched the landscape's impact on pest control and pesticide use through a "big data" project. This collaboration emphasizes ecoinformatic approaches, leading to the creation of an automated web platform for ingesting environmental data on ecosystem services that we are now developing. I've published seven scientific articles with them and I am also supervising the doctoral thesis of Mia Lippey.

Since 2022, I've been employed at the University of Extremadura in the Environmental Resources Analysis Group, actively engaging in projects assessing the impact of photovoltaic plant installations on ecosystem services (biocontrol pollination and carbon sequestration), with a budget of €850,000. These projects aim to contribute significantly to sustainable knowledge generation and transfer in collaboration with big companies. I also teach sustainable agriculture in the Enology degree and the Biotechnology Master.

My involvement spans 17 projects, two as PI. As Co-Principal Investigator for the AENEAS project (€300,000), we recently secured substantial funding (€1.4 million) for the EESE project of which I am also co-PI. I've significantly contributed to the conceptualization and development of two other

projects, providing intellectual input, efficient management, and effective leadership. In my role as data manager for the SECBIVIT project, I developed the Data Management Plan. I've supervised 3 PhD students and seven MSc students across four countries. Even more, I've reviewed more than 30 papers, and evaluated projects for the Spanish National Plan and BiodivERsA program. I am serving as an Associate Editor for the journal Frontiers in Sustainable Food Systems. I have published 30 peer-reviewed articles (1 Science, 3 PNAS), authored ten outreach papers, and created four databases, showcasing my commitment to advancing research and knowledge dissemination.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | POLO MONTERO, DAVID |
| **Referencia:** | RYC2023-044793-I |
| **Correo Electrónico:** | d.polo.montero@gmail.com |
| **Título:** | Virus entéricos y medio acuático |

**Resumen de la Memoria:**

Mi trayectoria se centra en el estudio de virus patógenos humanos y animales desde una perspectiva ambiental y de seguridad alimentaria, incluyendo i) Vigilancia, prevalencia, persistencia y diversidad en sistemas y organismos acuáticos ii) Nuevos métodos de detección, cuantificación y evaluación de la infectividad viral iii) Epidemiología basada en aguas residuales. Mis líneas de investigación se alinean con los objetivos y estrategias de la UE frente a la emergencia de virus patógenos, cambio climático, contaminación de sistemas acuáticos, escasez de agua y energía y seguridad alimentaria. Destaca la demostración de que la depuración comercial de los moluscos no es suficiente para lograr la eliminación viral o el desarrollo del primer modelo matemático sobre la cinética de depuración viral en bivalvos. Paralelamente, obtuve una subvención del MICINN para realizar una estancia en el CIEMAT-CSIC (plataforma solar de Almería). Allí, en colaboración con la Prof. Pilar Fernández Ibáñez (Ulster University), desarrollé una línea de investigación sobre procesos avanzados de oxidación, fotocatálisis y desinfección solar (SODIS) aplicados a la desinfección de virus en agua. En estos trabajos demostré la capacidad y el potencial de la energía solar para desinfección de virus en agua. En 2014 me doctoré (Cum Laude y premio extraordinario de PhD.). En marzo 2015 obtuve una posición postdoctoral en el IFREMER (Francia, Lab. de virus de FS Le Guyader) al que permanecí ligado hasta 2018, centrándome en el estudio de la persistencia de virus entéricos en agua de mar y ostras, epidemiología de gastroenteritis virales asociados a su consumo y en la utilización de sistemas celulares 3D (organoides) para evaluar la infectividad viral (técnica de cultivo celular disponible en muy pocos laboratorios a nivel mundial). Esto nos permitió evaluar por primera vez la persistencia en agua de mar de la infectividad real del NoV humano. Paralelamente realicé una estancia en el INSTITUTE PASTEUR (París, Lab. de virus entéricos de F. DelPeyroux) para ahondar en las técnicas de cultivo celular y ensayos de infectividad con poliovirus. En conjunto, estos constituyen uno de los trabajos más extensos en el área, y se alinean con el desarrollo de una nueva legislación de la UE que tenga en cuenta los virus entéricos. En 2019 regresé al grupo GIPA (Dpto. Microbiología, USC) como investigador postdoctoral, asociado también al nuevo centro singular CRETUS (https://cretus.usc.es/postdoctorados/). Mis esfuerzos se centraron en el desarrollo de un sistema de alerta temprana para COVID-19 mediante una epidemiología basada en aguas residuales. Destaca la primera detección a nivel mundial de la presencia de ARN del SARS-CoV-2 en un organismo marino. Realicé también una estancia en el IATA-CSIC, ampliando mis conocimientos en secuenciación masiva y metagenómica. Posteriormente realicé una estancia postdoctoral en el INSTITUTO ROSLIN (University of Edinburgh) centrándome en el estudio de técnicas de modificación genética (CRISPR/cas) y su aplicación en acuicultura y virología. Recientemente (1 diciembre 2022) obtuve una beca María Zambrano (atracción de talento internacional), como investigador posdoctoral asociado al grupo GIPA e instituto CRETUS. Soy profesor de la asignatura Microbiología I y II impartida en los grados de Biología, Biotecnología y Óptica y Optometría.

**Resumen del Currículum Vitae:**

- Soy primer autor en el 80% de mis publicaciones. Esto junto con el índice de impacto y la posición de las revistas en las que he publicado (la mayoría en D1) destacan la calidad de mi producción científica.
- Índice h 18; Índice i10: 21; Citas totals: 1031
- Total publicaciones: 26
- Total artículos JCR: 20 (15 como primer autor o autor de correspondencia)
- Artículos primer decil (D1): 16
- Artículos en primer cuartil (Q1):18
- Capítulos de libro (primer o ultimo autor): 5
- Acreditación ANECA Profesor Contratado Doctor (Ciencias de la salud).
- Participación como equipo de investigación en un total de 20 proyectos científicos.
- Docencia y tutorización oficial impartida: Profesor asignatura Microbiología I y II en el grado de Biología, Biotecnología y Optica y optometría.
- Tutorización de 5 TFG y 1 TFM. y prácticas externas (140 horas)
- Cursos y seminarios impartidos 1. Curso avanzado sobre Gestión de la seguridad en moluscos bivalvos. Entidad organizadora: FAO, CIEHAN y USC. 2. Seminario "Detección ambiental de SARS-CoV-2: Una epidemiología basada en las aguas residuales" para la asignatura "Biotecnología Farmacéutica". 2h. 09/04/2021
- Revisor científico en: Water Research, STOTEN, Marine Pollution Bulletin, Food and Environmental Virology, Frontiers in Microbiology, Food Microbiology, Int. J. Food Microbiol.
- Congresos y conferencias: 36 participaciones en congresos científicos (17 internacionales y 7 como presentación oral).
- Sociedades cientificas: Sociedad Española de Virología, European Society for Virology, World Society for Virology.
- Organización científica: Comité organizador del congreso internacional ISFEV 2022 celebrado en Santiago de Compostela (https://isfev2020.isfev.org/other).
- Estancias postdoctorales en el extranjero: ROSLIN Institute (University of Edinburgh), IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer, Nantes, Francia), INSTITUTE PASTEUR (París, Francia). Total: 27 meses
- Estancias nacionales: IATA-CSIC (Valencia), CIEMAT-CSIC (Almería). Total: 5 meses
- Premios y distinciones: Premio extraordinario de doctorado (Ciencias de la salud) y CDC award
- Otros: Revisor técnico y autor en McGraw-Hill para la elaboración de material didactico.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias agrarias y agroalimentarias** |
| **Nombre:** | BALANZA PEREZ, VICENTE |
| **Referencia:** | RYC2023-043104-I |
| **Correo Electrónico:** | vtebalan@gmail.com |
| **Título:** | Biotechnological approaches to control the end of flowering in crops |

**Resumen de la Memoria:**

During my research career I have studied multiple developmental processes in plants, such as flowering time, fruit development, meristem maintenance, seed abscission or leaf development, allowing me to acquire a broad knowledge of plant development, as well as a wide expertise in many experimental approaches and methodologies of molecular biology and genomics in the model plants Arabidopsis and pea (Pisum sativum). In addition, during last years I have led a small project and actually I participate in a second one, obtained from private companies, focused in the study of non model plants as canola (Brassica napus) and artichoke (Cynara scolimus).

I am pioneer in the study of the proliferative arrest/end of flowering as reflected by my last papers, establishing the end of flowering as a new developmental process that is partially controlled by the FUL-AP2 pathway. In this sense, the study of the end of the reproductive phase is new and unexplored, despite the huge impact that this knowledge could have both at the basic and applied level.

Most of my postdoc training has been made in a biotech company. My experience working in a biotech company has endowed me with a commercial point of view that will facilitate the transferability of the potential applications that the study of the end of flowering could have in modern agriculture. I would like to combine different research line to understand the biological relevance of this process in nature and their impact on economically important crops, using as model plants Arabidopsis, canola and cucumber. Preliminary results indicated that the end of flowering is affected by environmental factors as temperature or light quality as well as the abscisic acid hormone in the model plant Arabidopsis, and different reports indicated that these and more environmental factors, as drought and salinity impact negatively in the yield of many crops reducing the numbers of flowers produced by the meristems (early end of flowering). My main interest is to understand the processes that govern the end of flowering in plants and how they interact with environmental factors to allow the production of new varieties of plants more resistant and adapted to actual and future changes in the growth conditions, helping to maintain or even improve the yield of our crops.

**Resumen del Currículum Vitae:**

I have been always interested in genetics and molecular biology of plant development and in the application of basic science and how to implement it in a commercial way. I have studied different aspects of development as meristem maintenance, flowering time, flower and fruit development, leaf morphology, dehiscence and abscission processes, gametophyte initiation and seed development. My work has provided me with a wide knowledge of plant biology and the skills needed to perform high level science in plants. I have worked in public research centers and universities, but most of my postdoctoral training was made in collaboration with a private company. Thus, my research experience provides me with two different points of view of research, allowing me to connect basic and applied science and a valuable knowledge of the bioindustry context. A major drawback of my involvement with the company has been that most of my scientific research from this period has not been published, but I am author of 14 publications in high impact journals of the Plant Biology and Multidisciplinary categories (10 journal papers, 2 book chapters and 2 reviews) being corresponding author of 1 journal paper and 1 review, and first author of 7 works (4 journal papers, 2 book chapter and 1 review). In addition, I also have two public pre-prints where I am co-corresponding author, one of them accepted (pending minor revisions) in Plant Physiology, and the second under review in iScience, as well as two additional works under review in PNAS and Physiologia Plantarum. Despite my short list of publications my work has been cited by other 457 documents (source Scopus (552 cites), 766 cites Google scholar), and I have an h index of 11. In addition, I am author of a patent (WO2015150412A1).

During the last years I been mainly dedicated to the understanding of the processes that control the end of flowering in monocarpic plants. The obtained results have placed the group and myself in a pioneering position among the scientific community. Additionally, and independently to the research group where I belong, I have started a new project in collaboration with Nunhems B.V. (BASF group) to study the flowering time in globe artichoke.

During all this time I have collaborated with different international and national groups, as reflected by my publication list.

I have also acquired experience in teaching young students (practice of Botany, for the Degree Course of Biological Sciences, at the University of Milan; "Developmental Molecular Genetics" class at the IBMCP master's degree since 2019). I have supervised 2 final degree projects, 5 final master projects and one PhD, and every year I supervise 3-4 undergraduate students from several universities at their external practicum. At present I am co-directing 4 PhDs, two of them will be defended this year (2024), and the last two in 2027.

I am also review editor in Plant Evolution and Development in the journal Frontiers in Plant Science, and I have been chosen as independent referee for several draft manuscripts (from journals as Plant Cell, Cell Reports, Plant Physiology, JXB, BMC and others) as well as for grant applications (CSIC Uruguay).

During the last part of my career, I have been also participating in many scientific outreach activities directed to the community and especially to children and young people.

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| **Área Temática:** | Ciencias de la educación |
| **Nombre:** | VÁZQUEZ CALVO, BORIS |
| **Referencia:** | RYC2023-043502-I |
| **Correo Electrónico:** | bvazquezcalvo@uma.es |
| **Título:** | Technology-Mediated Language Learning and Teaching: Enhanced Multimodality, Novel Interactions, and Emergent Literacies |

**Resumen de la Memoria:**

Academically known as Boris Vazquez-Calvo, my career has been shaped by a unique blend of scientific achievement, global mobility, leadership, and a forward-thinking research vision in technology-mediated language learning and teaching. This journey began with early influences from my migrant family's intercultural and plurilingual background, which deeply informed my identity and approach to language education. These intrinsic motivations evolved into a dedicated academic and scientific pursuit, focused on exploring the intricate relationship between technology, language learning, and teaching. My work seeks to unravel how technology can be harnessed to enhance the language learning experience. My scientific contributions, evidenced by a substantial array of publications, demonstrate a deep commitment to enhancing language pedagogy through and/or with technology. Recent work delves deep into the efficacy of fan and game-based activities in English writing, the role of social media platforms like TikTok and YouTube in learning less commonly taught languages, or the exploration of online literacy practices, cementing my status in language pedagogy and applied linguistics alike. My internationalization and mobility are marked by significant stints in countries such as Denmark, Sweden, Japan, Portugal, Brazil, and the UK, totaling around 33 months. This international exposure has not only broadened my academic and cultural horizons but also facilitated collaborations with researchers globally, contributing to my involvement in prestigious projects and edited volumes. In terms of independence and leadership, I stand out as a principal investigator in several high-profile projects. These projects range from exploring the impact of digital technologies on pre-service language teachers to explicating the role of social media and video games in language learning and teaching. My leadership in these initiatives underscores my innovative approach to language learning, consistently pushing the boundaries of traditional methods. Further, my roles in various projects highlight my dedication to digital literacy and the integration of emerging technologies in educational settings. Looking ahead, my research agenda is set to make significant strides in technology-mediated language learning and teaching. Focused on three interrelated subareas—enhanced multimodality, novel interactions, and emergent literacies—I aim to align language education with the rapid advancements in digital technologies. My objectives include examining the integration of diverse communication modes in digital learning environments, exploring the effects of AI-enhanced chatbots on language learning, and studying new literacies for the digital age. This ambitious agenda is structured into five phases, encompassing specialized training, empirical studies, teaching-based research proposals, scientific production, and dissemination, ensuring a comprehensive approach to advancing the field of language education. Overall, my profile is a testament to my commitment to innovative approaches in investigating language learning and promoting language pedagogy, marked by a strong scientific foundation, international experiences, leadership roles in meaningful projects, and a strategic vision for future research in the ever-evolving landscape of digital technologies and language learning.

**Resumen del Currículum Vitae:**

I am currently an assistant professor in English Language Pedagogy at the Universidad de Málaga, specializing in technology-enhanced language learning, digital literacies, and English and foreign language pedagogy. My academic journey began with a BA in Translation & Interpreting from the University of Vigo, followed by a Postgraduate Certificate from Westminster University, a Master's at the University of Santiago de Compostela, and culminating with a PhD from Pompeu Fabra University. My scholarly impact is considerable, as evidenced by an H-index of 12 on Google Scholar, 6 on both Web of Science and Scopus, and an increasing total of over 527 citations on Google Scholar. This achievement highlights the broad influence of my 34 published papers, including 12 in prestigious Q1 journals and an equal number in internationally recognized publishing houses such as Routledge and Palgrave Macmillan. In research, I have taken on pivotal roles in 12 projects, notably serving as Principal Investigator in 3 of them (2 being externally funded research projects, and 1 being a postdoc grant). My international research footprint extends across the UK, Brazil, Denmark, Sweden, Japan, and Portugal, while I also hold close relationship with researchers and colleagues in China, Macau, Hong Kong, the US, and Australia, not to mention my domestic network (mostly UPF, UAB, USC, UMA, UCM, USevilla). In my teaching capacity, I am currently delivering graduate and master's level courses in Language Didactics at UMA-Málaga and have also contributed to teaching Spanish as a FL at the European University of Madrid. My previous academic positions include assistant professorships at UBurgos and UAM-Madrid, postdoctoral researcher roles at USC/U. Southern Denmark, and predoctoral roles at Pompeu Fabra University. My teaching expertise spans across a range of subjects including language pedagogy, translation, English, and Spanish. My research primarily focuses on technology-mediated language learning and teaching, highlighted by key projects like SEGUE and DEFINERS. I have been an integral part of competitive research groups/projects like DERG, Didactics and School Subjects at Southern Denmark University, GRAEL at Pompeu Fabra Uni., and Stellae at the University of Santiago de Compostela. As a supervisor, I am currently overseeing 2 PhD theses and have successfully guided over 20 Master's theses, most achieving high grades, and have been actively involved in numerous examination boards. My dedication to academia is further demonstrated through my participation in over 50 conferences, including 10 as either a keynote speaker or invited in some capacity, as well as my role in organizing international seminars. In the industry, I have delivered lectures and talks at leading players in the private sector of language learning apps, such as Duolingo, contributing my expertise to the field. Additionally, as a skilled sworn translator between English and Spanish, I have been involved in translation transfer contracts and educational material design, serving as a pedagogic consultant for Mizar-Aula Planeta and co-authoring computer-assisted language learning materials for FUNIBER. Marked by a diverse and influential career, my professional journey reflects a profound commitment to both education and research, underscored by impactful trajectory that is continually maturing.

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| **Área Temática:** | Ciencias de la educación |
| **Nombre:** | GONZALO SKOK, OLIVER |
| **Referencia:** | RYC2023-045305-I |
| **Correo Electrónico:** | oligons@hotmail.com |
| **Título:** | Optimización del rendimiento físico en los deportes de equipo |

**Resumen de la Memoria:**

Mi trayectoria científica comenzó en 2012 al completar el Máster Oficial en Rendimiento Físico y Deportivo en la Universidad Pablo de Olavide. Anteriormente, terminé el Máster Profesional en Alto Rendimiento en los Deportes Colectivos en el año 2010. A partir de ese momento comencé a interesarme por la investigación. En mi etapa pre-doctoral (defendí mi tesis en enero del 2015), publiqué 4 artículos JCR (3 Q1 y 1 Q2), ya que los 6 artículos que compusieron mi tesis doctoral se publicaron posteriormente a la fecha de la defensa. En la etapa post-doctoral (a partir de 2015), comencé a generar vínculos internacionales con diferentes autores (Portugal, Qatar, Chile, Reino Unido, Australia...) y desarrollar diferentes proyectos de investigación relacionados con el entrenamiento de fuerza en jóvenes deportistas de equipo analizando el efecto que tenían sobre su rendimiento, las asimetrías funcionales y la prevención de lesiones. En los siguientes años publiqué 4 (2015), 5 (2016), 6 (2017) y 4 (2018) artículos indexados en el JCR. Sin embargo, no es hasta 2019 cuando se consolida mi carrera investigadora. En 2019 y 2020, publiqué 17 y 12 artículos JCR, respectivamente. Además, entre 2021 y 2023, recibí un total de 1056 citas. Actualmente, el número total de citas de mis artículos es de 1597 y 1419 sin autocitas (Web of Science). En relación al Índice H, el impacto de mi investigación ha hecho que sea de 23 y un i10 de 40 (Web of Science).

Mi principal línea de investigación ha estado relacionada con la optimización del rendimiento deportivo en los deportistas de equipo. La presente línea de investigación ha tratado de encontrar los métodos de entrenamiento más efectivos para la mejora del rendimiento, minimizar el riesgo de lesión, o tolerar mejor la fatiga. Los temas más relevantes son:

1) Asimetrías funcionales: 21 JCR
2) La velocidad en el cambio de dirección: 19 JCR
3) La capacidad de repetir acciones de alta intensidad: 14 JCR
4) Entrenamiento con sobrecarga excéntrica: 13 JCR
5) Especificidad de la dirección en el entrenamiento de fuerza: 5 JCR

Dicha línea de investigación se ha ido desarrollando a través de las diferentes tesis doctorales que he dirigido. Las asimetrías funcionales fue el tema principal de 2 tesis ya defendidas (Elena Mainer Pardos en 2020 con mención internacional y de calidad y Alejandro Moreno Azze en 2022). En el caso de Elena, también se analizó en profundidad la velocidad en el cambio de dirección, mientras que en el de Alejandro se centró adicionalmente en el entrenamiento con sobrecarga excéntrica. Ambas tesis produjeron 7 artículos JCR del WOS.
El tema relacionado con la capacidad de repetir acciones de alta intensidad se ha analizado en profundidad mediante las tesis de Víctor Martín Domínguez (2019) y Jorge Arede (2021), esta última en Portugal. La producción científica de este tema a través de las dos tesis fue de 6 publicaciones JCR del WOS.
En la última de las tesis ya defendidas, Jorge Sánchez Sabaté (2024) desarrolló el tema de la especificidad en la dirección del entrenamiento de fuerza. Su tesis estuvo compuesta de 3 artículos JCR del WOS.
Por último, 4 artículos JCR del WOS han recibido un total de 448 citas y 36431 lecturas en el portal ResearchGate. El número total de lecturas en ResearchGate es de 139703, destacando el impacto de mis publicaciones en la comunidad científica.

**Resumen del Currículum Vitae:**

Obtuve mi doctorado en Ciencias del Deporte en 2015 (UZ), que comencé en 2012 después de realizar dos Máster. Fui supervisado por Julio Tous-Fajardo y José Antonio Casajus. Anteriormente, comencé mi carrera predoctoral en la Universidad de San Jorge en 2013 (Profesor e Investigador) y continué trabajando allí hasta 2019. En 2019, el Sevilla F.C. me contrató para desarrollar el área de investigación en fuerza y acondicionamiento, prevención de lesiones y rehabilitación desde el departamento de I+D+i y trabajando directamente en el 1er equipo que ganó la UEFA Europa League en 2020 siendo el club con menor incidencia de lesiones de toda Europa. En 2022 comencé a trabajar como Profesor titular en la Universidad Loyola Andalucía. He publicado 67 artículos revisados por pares en revistas indexadas en el catálogo Journal Citation Reports (JCR). En 44 de ellos, firmé en puestos relevantes (primer, último o autor correspondiente). Asimismo, 29 de mis artículos JCR están en revistas del Q1 y 26 en revistas del Q2 (82%). Además, mi índice H es 30 en Google Scholar (2968 citas) y 23 en WOS (1594 citas), mientras que mi índice i10 es 51 (Google Scholar). Además, he presentado más de 50 contribuciones a congresos internacionales. Tales logros me ayudaron a obtener un sexenio de investigación (Sexenio) de 2013 a 2019. Esta producción científica ha facilitado muchas colaboraciones internacionales (el 70% de mis artículos JCR han sido publicados colaborando con autores internacionales). Además, he participado en seis congresos internacionales como conferenciante principal y en 4 Congresos Internacionales como miembro del comité científico. He realizado varias estancias (2016, 2017, 2018, 2019 y 2022) en la Universidad de Tras-os-Montes e Alto Douro.
Fui responsable de Performance & Research desde 2013 hasta 2019 en Basket Zaragoza (Liga ACB). Además, he sido responsable de 13 estudiantes durante sus prácticas de Grado y Máster. Tuve un contrato de investigación con el Real Zaragoza (2ª División) para optimizar el rendimiento de los jugadores de 2017 a 2019. También fui invitado por los Philadelphia 76ers (equipo de la NBA) para compartir con ellos mi investigación y su aplicación sobre la prevención de lesiones, las estrategias de recuperación y el rendimiento físico (2017-2018).
He contribuido exitosamente a la formación de jóvenes investigadores a través de 5 tesis doctorales. Estas tesis doctorales están asociadas a 23 artículos del JCR (8 Q1, 10 Q2) y obtuvieron la máxima calificación. Además, he dirigido 28 TFM. Actualmente estoy trabajando en 4 tesis doctorales. Por otro lado, soy editor asociado de Frontiers in Sports and Active Living (Q2 JCR a través de JCI). He actuado como revisor en más de 30 ocasiones de 14 revistas (JCR).

En cuanto a la docencia, obtuve el quinquenio de excelencia docente en 2019. En este sentido, cuento con 11 años de experiencia docente con un total de 320 ECTS. Durante estos años he participado como profesor experto en 13 Máster. Actualmente soy el Coordinador del Grado en Ciencias del Deporte (Universidad Loyola Andalucía) desde 2022. También he sido galardonado en dos ocasiones con la 2º mejor comunicación oral en congresos internacionales.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias de la educación |
| **Nombre:** | VIDU AFLOAREI, ANA |
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| **Correo Electrónico:** | ana.vidu@deusto.es |
| **Título:** | Educational spaces free of violence |

**Resumen de la Memoria:**

Engaged in scientific research since she was an undergraduate in Sociology in 2007, Dr. Vidu has accomplished research targets with excellence and enthusiasm. In 2011, Dr. Vidu decided to dedicate her research to the study of sexual harassment in institutions in Spain, being a pioneer in the field at that time. Dr. Vidu received the Distinction Award for her Bachelor's degree (2011) and the Distinction Award for her Master (2012) as the best student for her cohort. Her Ph.D. "Networks of Solidarity. Student mobilizations against sexual violence in universities," first on this issue in Spain (Outstanding Cum Laude, International provided pioneer scientific knowledge on academic sexual harassment in the country, comparing the treatment of gender violence at UC Berkeley and the University of Barcelona. The treatment suffered for breaking the silence (being the first survivor filing a complaint against a professor for sexual harassment in Spanish academia) led to the creation of the pioneering concept of Isolating Gender Violence. Ana studied the structure of universities, the resistance to breaking the silence and thus came to study the role of support and the role that solidarity networks play in providing it to victims. Throughout her academic career, she has been equipped with competencies and skills that enable her to engage in advanced study and independent scholarly research. Ana co-founded the first peer-to-peer Solidarity Network of Victims of Gender Violence in Universities, recognized as Best Practice by the Women's Institute of the Spanish Government; currently called MeToo Universidad, part of the World Me Too Univeristy Network. She co-organized the first Spanish workshop on the Second Order of Sexual Harassment (2016) and published the first article on the issue in Spain. The press echoed the case, highlighting the documentary of DocumentosTV-RTVE: "Voices against silence", winner of the Golden Globe Award at the World Media Festival in Hamburg 2018. In September 2017, Ana joined the University of Deusto to pursue her first two-year postdoctoral fellowship within a multidisciplinary research team, EDISPe. Currently, Dr. Vidu is developing the project: "UniswithHeart: Student networks leading the struggle for universities free of sexual violence: mechanisms to support survivors, inspiring institutional changes for violence prevention" (H2020, ID: 894554, Sep 2021- Aug 2024), working with Prof. Michael Burawoy. The last year of the grant is conducted at the University of Deusto, working with Dean Prof. Gema Tomas. The professional and academic trajectory of the applicant reveals her capacity to articulate and led excellent research production and other extra-academic collaborations. In this sense, as a member of the European Sociological Association's Executive Committee, Vidu contributes to creating the association's first anti-harassment policy. She is also co-coordinator of the ESA Research Network RN33 on Women's and Gender Studies, editing a book and preparing a conference and a mid-term conference for the members. She is chair of the DEI Committee at the Berkeley Postdoctoral Association (contributing to creating the Association's Ethical Guidelines).

**Resumen del Currículum Vitae:**

Ana Vidu is a EU Marie Sklodowska-Curie Postdoctoral Fellow (ID: 894554, 2021- 2024) at the University of California, Berkeley and the University of Deusto. She is a member of the multidisciplinary research team, EDISPe (Social Development, Economy and Innovation for People). Dr. Vidu was a Juan de la Cierva fellow at Deusto (2020-2021) and a FPU predoctoral fellow (2012-2016) at the University of Barcelona. She was awarded the Extraordinary Bachelor's Prize (2011) and the Extraordinary Master's Award (2012).

She was an FPU predoctoral fellow at the University of Barcelona from 2012-2016, tutored by Prof. Ramon Flecha. She was hired at the University of Deusto with her first postdoc (2017-2019) in the interdisciplinary research group EDISPe. Dr. Vidu enjoyed a Juan de la Cierva fellowship for almost two years (Jan 2020-Sep 2021) (€50.000) at the University of Deusto, developing a project analyzing the social and legal implications of both direct and second-order sexual harassment. Prior to her two-year post-doctoral research as Marie Curie Fellow at the UC Berkeley Sociology, she received two mobility scholarships under the FPU Program: at Harvard University (2014) and UC Berkeley (2015), and a third one at Stanford University (2016) under the MSCA RISE Exchange grant. In 2020, she won the Marie S. Curie Postdoctoral Fellowship (H2020 Global Fellowship). She participated in 16 national and international research projects, 7 funded by the European Research Framework Program; and 9 financed by the Spanish RD Research Plan. She has published 25 scientific articles in indexed JCR WoS Journals, 7 book chapters, and 3 co-edited books. Her work has been presented in 59 conferences (47 international) and 76 invited talks (31 international). Vidu is an elected member of the Executive Committee of the ESA (European Sociological Association). She is the co-coordinator of the ESA Research Network RN33 on Women's and Gender Studies. Ana is Chair of the Diversity, Equity and Inclusion Committee of the Berkeley Postdoc Association (BPA) and Chair of the Gender Committee of the Horizon Europe competitive project SCIREARLY - Policies and practices based on scientific research for reducing underachievement and early school leaving in Europe. She has carried out teaching tasks as part of her FPU contract (2012/2016) and co-leaded a Doctoral dissertation (defended in 2020). Her work has been published in top-ranked JCR WoS Journals, such as Qualitative Inquiry, Masculinities and Social Change, Feminist Media Studies or Sexuality Research and Social Policy. Combining research with teaching, she taught 13 shared subjects as part of her FPU contract. She been an Editorial Assistant (2015-2020) of the ISA Journal "International Sociology" (JCR, Q2, WoS) and an Editorial Assistant (2012-2018) of the "International and Multidisciplinary Journal of Social Sciences", indexed in Scopus and ESCI-WoS. She is a Reviewer for several indexed journals. She is also a member of the ISA (International Sociological Association), the ASA (American Sociological Association), and the EWLA (European Women Lawyer Association); on the ground, she is a member of the Unitary Platform against Gender Violence.

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| **Área Temática:** | **Ciencias de la educación** |
| **Nombre:** | CARRASCO AGUILAR, CLAUDIA LORENA |
| **Referencia:** | RYC2023-042800-I |
| **Correo Electrónico:** | nadieseeducasolo@gmail.com |
| **Título:** | IDENTIDAD Y ROL DOCENTE DEL PROFESORADO DE SECUNDARIA: INTERSECCIONES CON SU FORMACIÓN INICIAL, DESARROLLO PROFESIONAL CONTINUO Y LA RELACIÓN CON SUS ESTUDIANTES |

**Resumen de la Memoria:**

La candidata es Psicóloga (mejor expediente), Máster en Psicología Social (co-tutela U. Arcis y U. Autónoma de Barcelona). Realizó un Postítulo en Teorías de Género y Políticas Públicas en la U. de Chile y un Diploma de Estudios Avanzados en Didáctica de las Cs. Sociales, U. de Valladolid. Prácticamente, toda su carrera la ha desarrollado en Chile. Entre 2007 y 2015 realizó docencia e investigación sobre convivencia escolar y políticas educativas en Chile y Latinoamérica, con financiación UNESCO, OEI, CORFO, ANID, coordinó el Programa de Apoyo a la Convivencia Escolar (PUCV) y trabajó con investigadoras de Argentina y México. En 2015 se adjudicó un concurso público como profesora a tiempo completo en la Universidad de Playa Ancha de Ciencias de la Educación (UPLA), Chile, donde actualmente ejerce como Profesora Titular. Entre 2015 y 2018 cursó el Doctorado en Ciencias de la Educación en la Universidad de Granada con la financiación de Beca ANID (Gobierno de Chile). Obtuvo la Mención Internacional con una estancia de 6 meses en la U. La Sapienza Italia, evaluación Cum Laude. Su tesis fue reseñada en el Boletín de la Sociedad Española de Educación Comparada (diciembre 2018, N°2). Su investigación versó sobre la identidad docente y las políticas de accountability en Chile, Suecia e Italia. En 2019 se adjudicó un Proyecto Fondecyt ANID (I+D) como Investigadora Principal, con un presupuesto de $US 84.444 para 3 años y dirigió un equipo de 5 investigadores jóvenes y más de 25 ayudantes de investigación. Con el apoyo de la Universidad de Jaume I (Dra. Mar Valero - OPSIDE) en 2020 fundó y dirigió el Observatorio Psicosocial en Situaciones de Emergencia, liderando una línea sobre procesos psicosociales en educación, desde la cual, ha trabajado sobre el rol docente en contextos de crisis. En su trayectoria, ha dirigido más de 10 proyectos de investigación e innovación, publicando sobre 50 artículos científicos. Ha dirigido 16 tesis de Postgrado, otorgando becas asociadas a sus proyectos.

En 2021 se adjudicó una Beca de Fundación Carolina para una Estancia Postdoctoral en la U. de Málaga (Grupo ProCIE Dr. J. Ignacio Rivas) en la cual, recogió información sobre las trayectorias docentes en España. En 2023 se adjudicó la Beca ANID para una Investigación Postdoctoral en la U. de Granada (Grupo FORCE Dr. Jesús Domingo-Segovia), en la que ha investigado sobre la relación entre las ecologías de aprendizaje, la formación inicial y el desarrollo profesional docente en Andalucía. Desde los últimos 5 años pertenece a grupos de investigación de impacto internacional como la Red Latinoamericana de Convivencia Escolar (RLCE) y el International Observatory for School Climate and Violence Prevention (IOSCVP). Actualmente, la candidata busca analizar la identidad y rol docente de profesores de secundaria, con un enfoque de educación comparada e internacional. Para ello, se ha propuesto relacionar la formación inicial, el desarrollo profesional y la relación del profesorado de secundaria con sus estudiantes, a través del estudio de los componentes motivacionales de la identidad docente, el aprendizaje continuo, la relación entre rol docente y clima de aula, y las trayectorias identitarias; en países con diferentes modelos de formación docente. Esta línea representa la integración de los trabajos más importantes en sus 17 años de carrera.

**Resumen del Currículum Vitae:**

Psicóloga, Máster en Psicología Social. Doctora en Ciencias de la Educación Mención Internacional (Cum Laude) U. de Granada, España. Profesora Titular a tiempo completo en la Universidad de Playa Ancha de Ciencias de la Educación, Chile. Pese a que prácticamente toda su carrera la ha desarrollado en Chile, en 2023 ha sido acreditada como Contratado Doctor y Profesor de Universidad Privada por la ANECA en España. En relación con la gestión universitaria, ha sido Directora del Dto. de Mediaciones y Subjetividades en la Facultad de Ciencias Sociales de la U. de Playa Ancha, y Coordinadora Gral. de Investigación en la misma Facultad. Forma parte del grupo de Pares Evaluadores de Programas de Postgrado de la CNA-Chile y además, ha evaluado como par ciego 17 proyectos competitivos de investigación (ANID y CNED).

En los últimos 5 años ha dirigido dos proyectos de investigación de más de $US 80.000 en total, destacando Fondecyt N°11190339 sobre trayectorias docentes; y ha codirigido 2 Fondecyt Regulares y 1 Fondef, por más de $US 300.000.- A lo largo de su carrera ha dirigido 9 proyectos de investigación y 6 proyectos de innovación, todos concursables con revisión ciega de pares. A la fecha, la candidata forma parte de grupos de investigación en Chile como el Programa de Apoyo a la Convivencia Escolar (PACES) y el Instituto Interuniversitario de Investigación Educativa (IESED), mientras que mantiene una colaboración activa con el Centro EduInclusiva (CIE-160009 PIA-ANID, Gobierno de Chile).

En el ámbito de la internacionalización, en los últimos 5 años se ha adjudicado 2 becas competitivas para realizar investigaciones postdoctorales fuera de su país, de entre 3 a 12 meses (Fundación Carolina y ANID), y ha obtenido financiamiento público para una estancia internacional de 5 semanas. En 2023, el Grupo de Estudio de Investigaciones en Políticas de Evaluación Educativa y Accountability en América Latina la invitó como Conferencista al II Seminario Internacional de Políticas de Evaluación y Accountability. Actualmente, forma parte de grupos de investigación internacionales como la RLCE y el IOSCVP y, en los últimos 5 años, ha presentado comunicaciones en 12 congresos internacionales, destacando el CICE23, 11th ICESD, WCVS2023, IX CIMIE, AIDIPE 2019, entre otros.

En materia de formación de jóvenes investigadores, en los últimos 5 años ha dirigido 8 TFM y 3 Tesis Doctorales (una en proceso), de un total de 16 tesis de Postgrado y 35 tesis de Grado. Forma parte del Claustro Académico de un Máster y dos Doctorados, y ha sido profesora invitada de Postgrados en Chile y España. Actualmente es profesora externa del Doctorado en Ciencias de la Educación de la UGR.

En materia de divulgación científica, posee un H-INDEX SCOPUS 10, y ha publicado con investigadoras e investigadores como Carina Kaplan (U. Bs. Aires), Antonio Luzón Trujillo (UGR), Verónica López (PUCV), Michael Murphy (Harvard Medical School), Ron Avi Astor (UCLA), entre otros. A lo largo de su carrera, ha publicado más de 50 artículos científicos (6 JCR -Q1 y Q2-, 18 SJR, 13 SciELO o ERIH y 17 otras index.), 19 capítulos de libro, y ha

editado 2 libros. Actualmente se encuentra a la espera de la publicación (en prensa 2024) de 2 artículos SJR y 2 capítulos de libro, así como de la evaluación de 8 artículos SJR enviados en 2023.

**Área Temática:** Ciencias de la educación
**Nombre:** ALCÁNTARA ALCÁNTARA, JUAN MANUEL
**Referencia:** RYC2023-045700-I
**Correo Electrónico:** juanma.alcantara@hotmail.com
**Título:** Beyond the Classroom: A Holistic Approach to Health and Learning Interventions

**Resumen de la Memoria:**

After my BSc in Physical Activity and Sport Sciences (2014), I carried out a MSc in Research in Physical Activity and Health (2015), and started my PhD (2016-2020) with a FPU grant (Ref.: FPU15/04059). During my PhD studies, I participated in one of the most comprehensive studies in physical activity and health, funded by ISCIII (Ref: PI13/0139). Additionally, I participated in different lifestyle interventions in the fields of physical activity, educational environment and/or health. During my PhD I worked in the PROFITH research group with Dr. Jonatan Ruiz (University of Granada), and performed 2 international stays (6 months) with Dr. John Blundell (University of Leeds), and with Dr. José Galgani (Pontificia Universidad Católica de Chile). Both stays were funded by competitive mobility awards. In December-2020 I finished my PhD at the University of Granada (Cum Laude; international PhD). With my PhD, I made a significant contribution to current procedures and methodologies for assessing metabolism and health through the gas exchange measurement.

From 2021 to 2022, I continued in the PROFITH research group thanks to a postdoctoral grant funded by the University of Granada (Plan Propio de Investigación). Later, in 2022, I was awarded with 3 different postdoctoral grants: a postdoctoral fellowship funded by the Junta de Andalucía, a Margarita Salas and a Juan de la Cierva – Formación. I decided to select the JdC-F (Ref.: FJC2020-044453-I), and in April-2022 I moved to Public University of Navarra with Dra. Idoia Labayen (ELIKOS research group). There, I am involved in diverse research projects focused on studying the effects of nutrition and physical activity based lifestyle interventions on health of individuals suffering from diverse cardiometabolic diseases (e.g., Refs.: 0011-1365-2023-000105, PJUPNA2023-11386).

In brief, my scientific career is focused on understanding the role of lifestyle interventions (nutritional and/or exercise interventions) on health. Additionally, I carry out a complementary research line focused on the development of new methodological advances for improving human metabolism assessments using non-invasive biomarkers.

Since the start of my scientific career, I have published 55 JCR articles, most of them as relevant author and in first-quartile journals. I have actively participated in 15 research projects, I have been co-PI of 1 and project manager of 2 research projects. I have organized 1 national and 1 international conferences, and have presented results in 32 national and international conferences. Since Dec-2020 (I obtained my PhD), I have supervised 3 MSc students and 1 practicum student. In 2022, I was accredited as Profesor Contratado Doctor by ANECA.

Based on my previous research, I would like to expand my research and put together all the methodological knowledge obtained during my PhD studies and postdoctoral phase for objectively assess health and metabolism, and my teaching vocation to improve educational programs related to physical activity, nutrition and health.

**Resumen del Currículum Vitae:**

- Post-doctoral fellowship Juan de la Cierva – Formación (from April-2022 to April-2024).
- Pre-doctoral fellowship Formación de Profesorado Universitario (FPU; from 2015 to 2020).
- Other fellowships/grants: Post-doctoral fellowship by PAIDI 2021 (Declined because the candidate decided to select the JdC-F); Post-doctoral fellowship Margarita Salas (Declined because the candidate decided to select the JdC-F); Mobility grant funded by the Plan Propio de Investigación from the University of Granada; Mobility grant funded by the Spanish Ministry of Science and Innovation.
- Participation as researcher in projects yielding > 1M€
- Involvement in day-to-day management and development of 15 research projects (funded by Instituto de Salud Carlos III, Consejo Superior de Deportes, Junta de Andalucía, among others).
- Co-PI of two projects, one of them funded by a private company, and project manager of another.
- 55 JCR publications, being 13 articles (24%) as first author, 8 (14%) as second author, and 7 (13%) as the last author. According to JCR, 22 (40%) were published in journals that fall into the 1st quartile, and 91% fall into the 1st or the 2nd quartiles. Moreover, I have published 8 papers in journals that fall into the 1st decile, and in 3 of them I was first or last author.
- H-index of 19 and i10-index of 24.
- Top three most-cited articles have 54, 41, and 32 citations.
- >30 works presented at international and national scientific conferences as oral communication or poster communication.
- Member of the scientific and organizing committees of some international and national scientific conferences.
- International reputation. Reviewer for 15 different JCR journals such as the Sport Medicine (IF=9.8; D1) Obesity (IF=6.9; Q1) or Med Sci Sports Exerc (IF=4.1; Q1). All reviews are verified by Publons.
- Part of the "Diabetes and Metabolic Diseases research group" of the Navarra Institute of Health Research (IdiSNA), the Institute for Innovation & Sustainable Food Chain Development (IS-FOOD), the "Red de ejercicio físico y salud: Exercise is Medicine" (EXERNET), and the CCIBERobn
- Teaching experience: undergraduate and postgraduate level and international invitation talks. Cumulative teaching load: > 300 hours.
- Supervisor of Master's thesis and practicum.
- Co-supervisor of an ongoing Doctoral Thesis.

**Área Temática:**        Ciencias de la educación
**Nombre:**        MORALES ROJAS, JAVIER SALVADOR
**Referencia:**        RYC2023-045783-I
**Correo Electrónico:**        morales.javiersalvador@gmail.com
**Título:**        Physical Education strategies and Pediatric ONcology (PEPÓN)

**Resumen de la Memoria:**

Throughout my research career, I have dedicated my efforts to various sub-disciplines within the fields of Sport Sciences (e.g., Physical Education, exercise physiology, and exercise for health). This diversity of perspectives has equipped me with interdisciplinary knowledge converging towards a specific objective: disentangling the role of exercise in the prevention and treatment of non-communicable diseases (that is, the famous 'Exercise is Medicine' mantra).

In particular, my work has honed in on the application of this knowledge within the educational context, exploring how exercise can play a pivotal role in promoting healthy lifestyles from an early age. My research endeavors seek to understand how educational practices can effectively contribute to health promotion and disease prevention. Thus, aligning with the notion that physical activity can be a potent tool within the educational sphere to cultivate lifelong health and quality of life and emphasizing the critical role of health Education in empowering individuals to make informed choices for their overall well-being.

I have been a prolific author throughout my career, contributing to over 60 publications in high-impact JCR Journals (most of them in Q1/D1, including highly prestigious journals). Moreover, my scientific endeavors have been recognized with various awards. Furthermore, my scientific contributions have garnered recognition through various awards. Particularly noteworthy is the first National Sports Medicine Research Award 2018 by the University of Oviedo (entitled "Beneficios de un programa de ejercicio físico intrahospitalario en niños con cancer"), in which I coordinated this study as first author. Additionally, I have received the second prize of this esteemed award on two subsequent occasions. These awards complement other distinctions previously obtained during my university studies, such as the Award for Excellence in Academic Performance from the University of Granada and Caja Rural, as well as the Extraordinary Award for the best academic record of my promotion.

As a noteworthy aspect of my scientific career, I have recently been awarded two research projects as the Principal Investigator (PI), securing a total funding of over 150,000 € First, I was awarded my inaugural research project as PI (funding: 10,000€). I aimed to investigate the influence and interaction of COVID-19 and, one of my main areas of research, lifestyle (with an obvious focus on my specialty, exercise) with lifespan and health span. So far, we have analysed a cohort of more than 200 adults in the province of Cádiz (aged 50-79) and presented preliminary results have already been presented at conferences.

Additionally, the funding from the HIPATIA project (salary: 143,000€, instruments: 10,000€) at the University of Almeria (UAL) will serve as the cornerstone for establishing my own laboratory and to further expand my scientific leadership position. If granted the Ramón y Cajal fellowship, the UAL will further support the consolidation of my research project. In the coming months, I will remain focused on obtaining funding to continue shaping my future Physical Education laboratory at the UAL, which thanks to this HIPATIA project will now be a reality. In conclusion, my primary goal is to attain increasing independence as a Senior Researcher, particularly within the realm of Education.

**Resumen del Currículum Vitae:**

Dr. Morales has demonstrated multidisciplinary expertise, particularly emphasizing the educational aspects within Sport Sciences subdisciplines. In his pre-doctoral stage, he secured a JAE INTRO 2015 Research Introduction scholarship and an FPU contract, contributing significantly to advancing knowledge in the educational realm of exercise in pediatric cancer. His exemplary contributions earned him the first National Prize for Research in Sports Medicine. For instance, he created a large database of children and adolescents with cancer who were educated through exercise to promote an active lifestyle, significantly contributing to the advancement of knowledge in the educational realm of exercise in pediatric cancer.

During his postdoctoral phase with the MOVE-IT group at the University of Cadiz, Dr. Morales played a pivotal role in various national and international research projects, notably the EU4 Health Programme project, securing substantial funding of 2,493,100€ As the Project Manager, he dedicatedly worked on implementing educational strategies to enhance the quality of life for young people with cancer, emphasizing pillars such as outdoor physical activity, healthy eating, sustainability, and mental health promotion.

With over 60 publications in medium/high impact JCR Journals and a H-index of 17, Dr. Morales's prolific authorship reflects his impactful contributions. The majority of these publications (over 75%) hold Q1/D1 rankings, featuring in esteemed journals such as The Lancet Healthy Longevity and Sports Medicine. Internationalization has been a cornerstone of his scientific journey, with 35% of publications involving international collaboration, despite disruptions due to the COVID-19 pandemic. However, even with limitations in physical presence, his dedication to international collaboration transcends borders, and the impact of his work has a global reach, as will be highlighted below.

Demonstrating leadership, he independently published studies, securing over 150,000 € in total funding as the Principal Investigator for two research projects exploring the impact of COVID-19 and lifestyle on health span. Additionally, he has tutored or is tutoring twelve Master students and is co-supervising 1 PhD thesis, within the Education area of Sports Sciences.

Dr. Morales's commitment to scientific dissemination is evident in his co-editing role at Fissac, a Spanish-language platform for science education (with more than 100,000 social media followers), and participation in initiatives like the Exercise and Cancer Symposium and co-editing the book "El ejercicio, un muro contra el cancer". This fact serves as a valuable resource, contributing to the broader field of health education by bridging the gap between scientific knowledge and the general public.

Highlighting his fit in the field of education, Dr. Morales envisions the Ramón y Cajal fellowship as an opportunity to fortify his independent role as a research leader and establish his own research group. His passion for advancing research and education in Physical Education makes the education field the most fitting context for his impactful contributions, aligning with his commitment to enhancing the health and quality of life for children and adolescents through his research group.

**Área Temática:** Ciencias de la educación
**Nombre:** SÁNCHEZ LÓPEZ, IVÁN
**Referencia:** RYC2023-044777-I
**Correo Electrónico:** ivan.sl.pro@gmail.com
**Título:** CREATIVE CODE: AI AND GENERATIVITY FOR A METHODOLOGY AGAINST EMERGING GAPS.

**Resumen de la Memoria:**

Dr. Sánchez-López's research focuses on narrative (storytelling) within the communication framework, with a specific focus on three primary dimensions: mediations and formats, empowerment (including its intersections with education and inclusion), and creativity (embracing both artistic and media-related expressions). These facets are intricately interwoven through a cohesive framework inspired by the semiological guerrilla concept articulated by Eco. An innovative component of this research lies in the adoption of a differential approach: the com-educational vector. This implies a departure from the usual direction in which education addresses communication, repositioning communicative creativity as a potent catalyst for the enhancement of learning.

The methodological framework aligns seamlessly with this conceptual underpinning, employing a concatenated articulation across three tiers: Multimodal Discourse Analysis (assisted by Atlas.TI), interviews with privileged observers analyzed through Corpus Linguistics (Sketch Engine), and the utilization of Arts-Based Research (Adobe Creative Suite + Klynt) for constructing intervention platforms geared towards com-educational empowerment. The noteworthy outcomes of this preliminary phase find expression in articles published in esteemed scientific journals, including "Com-Educational Platforms: Creativity and Community for Learning" (Scopus Q1), "The explosion of digital storytelling: creator's perspective and creative processes on new narrative forms" (Scopus Q1) and "Digital creativity to transform learning: Empowerment from a com-educational approach" (JCR Q1). Additionally, these outcomes lay the groundwork for various book chapters (published between 2018 and 2021) and presentations at International Conferences. Particularly noteworthy are invited presentations at the 10th Symposium on Societies Facing the Digital Challenge: Challenges and Transformations from Education and Communication, titled "Counters of chaos: the digital narrative vanguard" (Barranquilla, Colombia), and at the V International Congress ALFAMED: Social Networks and Citizenship, titled "Creative empowerment in Generation Z" (Quito, Ecuador). This juncture marks the initiation of international collaborations within the Alfamed Network, assuming the presidency of Alfamed Joven. At this point starts the participation in the Ágora Group too. These engagements solidify with responsibilities in projects P18-RT-756 and RTI2018-093303-B-I00. Furthermore, collaboration commences in the European project "A Chance for Change: Empowerment and Restoration" (Grant Agreement 2019-1-UK-KA205-061341).

The receipt of the Margarita Salas Postdoctoral Aid in January 2021 heralds the commencement of a second phase, characterized by the implementation of insights gained during the initial phase for intervention purposes. Two pivotal projects are executed on the ground: Project T (Prototype Project), a methodology oriented towards digital creativity for the empowerment and inclusion of individuals with Asperger's, developed in collaboration with the ASPALI foundation; and the Project "Contribution to Media Literacy in the Caribbean".

This work is conducted with a primary emphasis on Open Science, and a commitment to the scientific dissemination of the results (https://acortar.link/1w3JrA).

**Resumen del Currículum Vitae:**

ARTÍCULOS CIENTÍFICOS

2023. Teachers on TikTok: Creative strategies and resources for making content go viral. An evolution in education? Anàlisi. SCOPUS (2022). Q1.
2022. Metaverso y educación: el caso pionero de Minecraft en el aprendizaje inmersivo digital. El profesional de la Información. JCR: Q1.
2021. Creatividad digital para transformar el aprendizaje: Empoderamiento desde un enfoque com-educativo. COMUNICAR. JCR Q1.
2020. The explosion of digital storytelling. creator's perspective and creative processes on new narrative forms. HELIYON. SCOPUS (2020). Q1.
2019. Com-Educational Platforms: Creativity and Community for Learning. NAER SCOPUS (2019) Q1.

CAPÍTULOS DE LIBRO

2023. Booktokers en el aula: Competencia mediática y fomento de la lectura a través de TikTok [128 – 137]. Dykinson, SPI Q1.
2022. Más allá de la alfabetización mediática. Recursos de la narrativa digital para la educación [417-437]. En Nuevos retos educativos e investigación interdisciplinaria. McGraw Hill, SPI Q1.
2021. Com-Educación: Creatividad Mediática para el empoderamiento [205-229]. En Educomunicación y empoderamiento en el nuevo munto Post-Covid. Tirant, SPI Q1.
2019. De lo audiovisual a lo transmedia. Competencias para las nuevas narrativas de los prosumidores en el ecosistema digital [119 – 146]. Pearson, SPI Q1.

LIBROS

2023. Investigación interdisciplinar. Educación y construcción del conocimiento. Tirant, SPI Q1.
2021. Currículum Alfamed de formación de profesores en educación mediática: MIL en la era pos-Covid-19. Octaedro, SPI Q1.
2019. Juegos y sociedad: desde la interacción a la inmersión para el cambio social. McGraw Hill, SPI Q1.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

CONGRESOS

- Mesa Redonda: " Netflix 1 – Lectura 0: generación Z, redes sociales y mediadores" . Ministerio de Cultura y Deporte. LIBER, IFEMA, Madrid.
- V Congreso Internacional ALFAMED: Redes sociales y ciudadanía. " Empoderamiento creativo en la Generación Z" . UTPL, UPS. (Quito, Ecuador).
- III Congreso Internacional de Competencias Mediáticas: Comunicación-Educación para el Bien Vivir. " Experiencias investigativas de Alfamed Joven" . Universidad Católica Luis Amigó (Medellín, Colombia).
- Ponencia Internacional. Cátedra Europa. 10 Simposio las sociedades ante el reto digital: Desafíos y transformaciones desde la educación y la comunicación. " Contadores del caos: la vanguardia narrativa digital" . UNINORTE (Barranquilla, Colombia).

PROYECTOS

- Clave RTI2018-093303-B-I00. I+D. Youtubers e Instagrammers: la competencia mediática en los prosumidores emergentes.
- Clave P18-RT-756. I+D. Instagrammers y Youtubers para el empoderamiento transmedia de la ciudadanía andaluza. La Competencia Mediática de los Instatubers.
- Estancia pre-doctoral. Grupo de Pesquisa Comunicação, Arte e Literacia Midiática, la Universidade Federal de Juiz de Fora (Brasil).
- A Chance for Change: Empowerment and Restoration. Erasmus + KA205.
- Red ALFAMED.
- Ayuda Postdoctoral Margarita Salas.

TRANSFERENCIA

- Contribución a la Alfabetización Mediática en el Caribe.
- Proyecto T (P. Prototipo). Creatividad digital orientada al empoderamiento y la inclusión.
- Proyecto " Una comunicación para el cambio social desde entornos digitales 2.0 para mejorar el impacto social de los agentes andaluces de la cooperación en un escenario post-covid" .
- UNESCO Chair on Education, Research and Digital Inclusion.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias de la educación** |
| **Nombre:** | PAGÈS MARTÍN, MARCEL |
| **Referencia:** | RYC2023-045118-I |
| **Correo Electrónico:** | marcelpages.pm@gmail.com |
| **Título:** | Trayectoria Investigadora - Marcel Pagès |

**Resumen de la Memoria:**

I investigate education policy and practice from the sociology of education perspective and educational research, applying qualitative and quantitative methods of public policy analysis and comparative strategies. My areas of interest include comparative education, the enactment and impacts of educational policies and school responses, the study of the development and consolidation of educational systems, and the policies of school governance and their relationship with inequalities. Specifically, I developed my research activity in two major areas of interest. First, the study of school governance reforms, particularly focusing on school autonomy, accountability, and school choice models, analysing the impact of these policies on educational equity at the system level. Second, I developed a second line of research on affirmative action policies, understood as targeted strategies for educational improvement in more disadvantaged school contexts. I published my work in high-ranked international research journals, such as 'Education Accountability Evaluation and Assessment' (Q1), 'Educational Review' (Q1), 'Compare' (Q1), and 'European Educational Research Journal' (Q2). Beyond scientific publications, I actively work to transfer the knowledge generated by my research to the policy field through partnerships and collaborations with public administrations (Ministry of Education, Barcelona City Council), International Organizations (UNESCO Teaching Task Force, European Commission), and educational foundations (Fundació Bofill). With these collaborations, I aim to improve education policies to enhance the quality and equity of education. My research aims to expand knowledge on the functioning of educational systems to contribute to social innovation in the field of public policies for educational improvement and social cohesion.

**Resumen del Currículum Vitae:**

I hold a PhD in Sociology and a Master in Labour, Welfare, and Public Policy. I obtained Cum Laude and international mention in my PhD. As a researcher, I have worked on outstanding international research projects, such as the REFORMED Project (GA-680172), founded by the European Research Council. The project was developed in collaboration with an international network of 13 associated researchers from 9 different countries and 11 higher education institutions. My experiences as a Visiting Researcher at both the University of Oslo and the Autonomous University of Madrid have enriched my perspective and expertise in educational governance and policy. I also participated in national (GENTRED) and local (DESEGPOL) research projects with important leadership roles. In 2022, I obtained the Margarita Salas Fellowship, a competitive funding scheme for young researchers. The grant was founded by the Next Generation EU instrument and aimed at the requalification of the Spanish Higher Education System. Under the Margarita Salas scheme, I joined the Department of Pedagogy at the University of Girona, where I have been developing my teaching and research tasks over the last two years. My academic merits are highlighted by academic publications in international research journals and conferences. Regarding my research contracts and transfer merits, I want to highlight collaborations with international organizations and public administrations, which have contributed to achieving a greater social impact and practical relevance of my research.

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| **Área Temática:** | Ciencias de la educación |
| **Nombre:** | GARCIA MOLSOSA, MARTA |
| **Referencia:** | RYC2023-043650-I |
| **Correo Electrónico:** | m.garcia@udg.edu |
| **Título:** | Socio-educational research in the field of vulnerable children and youth |

**Resumen de la Memoria:**

My research focuses on the education of vulnerable childhood and youth. As a researcher in the socio-educational field, I work with mixed methods in the context of multidisciplinary studies aimed at understanding the factors contributing to enhance the education of vulnerable children. Concretely, I am researching along the lines of subjective well-being studies, and I have specialized in analysing the outcomes of educational support programmes. Besides, I have recently developed research on gender-based violence from a child-centred approach.

I developed my early research in the University of Vic – UCC at the group of Dr. Collet-Sabé (GREUV). Linked to my area of professional expertise (social educator in a residential centre, 2005-2017), in my PhD thesis I analysed the role of mentoring in contributing to improve children's in residential care school experience and well-being (Garcia-Molsosa, M., et al., CHYSR, 2021; and Garcia-Molsosa, M., et al., CHYSR, 2019). My PhD included a short stay at the Institute of Education (UCL) and at York St. John University, with Dr. Claire Cameron, and Dr. Caroline Leeson.

In 2020 I moved to Girona to pursue specific training as a researcher in the Institute of Educational Research (IRE) from the University of Girona (UdG). I joined the Liberi Research Team in Childhood, Youth and Community (UdG), and the interuniversity research group Infància i Joventut: Acció socioeducativa i comunitària (IJASC) (SGR 01143), recently funded. This engagement has allowed me to work with large interdisciplinary teams with a huge proficiency in the field of socio-educational research and working with both qualitative and quantitative methods. Also, it has allowed me to broaden my field of research and open a secondary line on gender-based violence with an innovative participatory approach focused on children (Planas-Lladó, A., Garcia-Molsosa, M.*, et al., 2023; Montserrat, C., Garcia-Molsosa, M.*, et al., 2022). As a researcher attached to these teams, I have expanded my experience in developing research at a national and international level, as well as in collaborating with public institutions, regional governments, and NGOs. I have acquired new technical-scientific capabilities and skills, including complex inferring statistical analysis with RStudio (PCA, MCA, MLR, and SEM, among others), complex sampling processes, and the proficiency in participatory research methods with children as co-researchers. I am currently involved in most of the ongoing competitive projects of the team, as well as in transfer contracts, contributing to its growth and consolidation, assuming responsibilities such as data management planning and FAIR data advising, young researchers' supervision, and the design of projects for competitive calls to open and consolidate new lines of research.

My plans for future research include (1) the design, implementation, and evaluation of educational programmes for vulnerable children (including those in care); (2) the analysis of the system of beliefs, attitudes, values and normative codes of children and youth towards gender-based violence, as a risk factor to be addressed for prevention, detection and intervention; and (3) working towards the definition of new methods of participatory research with children, especially those most vulnerable, in the field of socio-educative research.

**Resumen del Currículum Vitae:**

Post-Doctoral researcher and Visiting lecturer at the University of Girona (Juan de la Cierva - Formación). During my research career, I have held highly competitive prestigious positions: (1) two competitive Doctorate contracts at the UVic – UCC (UVic-UCC 1st Call and FI-2017 EMC/2040/2016); (2) One of the only two post-doctoral contracts awarded to my discipline by the UdG in the 2021 call (POSTDOC-UdG2021/18); and (3) A Juan de la Cierva – Formación contract (FJC2021-047787-I), the second best grade out of 30 in my discipline. I have obtained research funds for 191,241.38€ as the sole PI. I have been Principal Investigator in 4 projects, and a member of a project funded by Spanish R&D Program, and a European project Erasmus+.

My work has resulted in 12 publications in the most relevant journals of my research area (10 JCR, 5 as first author, 5 Q1) with 135 citations in GoogleScholar and 46 citations listed in WoS Core Collection, 2 book chapters, and 11 international meetings, including Conferences, Workshops and Seminars. Most of my publications are Open Access, and the databases are available in Open Repositories (CORA.RDR). I had developed research at the Institute of Education (UCL) and at York St. John University (3,813€ of funding by 2019-1-ES01-KA103-060559 ERASMUS+, and 2019 FI_B200175), and I have collaborated with research institutions from Portugal (inED—Institut Politécnico do Porto, and REMIT—Universidade Portucalense). I review papers for Children & Youth Services Review (JCR, Q1).

In the area of knowledge transfer, my work has generated interest among professionals in education and social services and since 2020 I coordinate an interdisciplinary participatory workgroup linked to the UVic-UCC. I have been invited to several Seminars addressed to professionals, politicians, and technicians (Dixit – Department of Labour, Social Affairs and Families, and TIAF – Educational regional authority), and I promoted and organized the 1st Conference on Children's in Residential Care Education in Osona. Linked to the 4 research contracts with public institutions and NGOs in which I have participated, I have published several papers under open CC license, and I have participated in several training activities addressed to professionals.

Currently, I am co-supervisor of a PhD Thesis with funding (AGAUR). I have also directed 5 final year dissertations at a graduate level, and I have experience in training postgraduate students, including preparing and teaching Master courses (UdG). Since the beginning of my research career, I had 3 interruptions due to the birth of 3 children (2019, 2021, 2023, 12.5 months).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Ciencias de la educación
**Nombre:** NOBARI , HADI
**Referencia:** RYC2023-044253-I
**Correo Electrónico:** hadi.nobari1@gmail.com
**Título:** Ciencia del deporte
**Resumen de la Memoria:**

In my career, I've evolved into an accomplished sports scientist, emphasizing sports performance optimization and injury prevention in team sports. Building on post-doctoral work focused on team athlete training, my upcoming research integrates digital technologies into traditional methodologies. The proposed research plan, titled "Leveraging Digital Twins and Artificial Intelligence for Advanced Sports Performance and Injury Prevention in Team Sports," aims to develop predictive models, real-time monitoring systems, and personalized training regimens.

Research Objectives:

Predictive Models for Injury Prevention:

-Develop AI-driven models predicting sports injuries based on athletes' metrics.
-Evaluate model effectiveness in identifying injury risks and informing preventive measures.

Real-time Performance Monitoring:

Create a system integrating digital twins and AI for real-time monitoring of athletes' performance.
Assess accuracy, reliability, and practicality of real-time monitoring tools.

Personalized Training Regimens:

-Design personalized training programs using digital twin technology and AI.
-Evaluate the impact of personalized regimens on performance enhancement and injury prevention.

Methodological Details:

AI Algorithms: Use machine learning to analyze athlete data for injury prediction and performance enhancement.
Digital Twin Technology: Create virtual athlete replicas to simulate and analyze performance.

Difference and Added Value:

This research departs from traditional sports science by introducing digital twin technology and AI in team sports. The fusion enhances precision in training programs, potentially revolutionizing the field, and benefiting team athletes' well-being and performance.

Specific Research Activities:

Data Acquisition and Processing:

-Collect comprehensive data on athletes' metrics.
-Include pre-season assessments, training sessions, and competitions.

Digital Twin Development:

-Create digital twins for each athlete.

Machine Learning Model Development:

-Train AI-driven models using digital twin data.

Real-time Monitoring System Development:

-Implement a system for real-time monitoring.

Personalized Training Regimen Generation:

-Develop algorithms for personalized training programs.

Performance Evaluation:

-Assess model, monitoring system, and training regimen effectiveness.

Implementation Plan:

Collaboration with University of Freiburg, Germany:

-Utilize facilities and expertise for academic and industry insights.

Partnership with NSAtech LLC, Qatar:

-Extend collaboration for practical insights and real-world application.

Collaboration with sports teams:

-Apply research findings in practical settings.

Pilot studies with professional teams:

-Validate and refine methodologies.

Dissemination and Implementation:

-Disseminate findings through publications, presentations, and workshops.
-Promote adoption of digital twin and AI-based approaches in team sports.

**Resumen del Currículum Vitae:**

I earned my Ph.D. in Exercise Physiology in 2021 from the University of Isfahan, Iran, with a unique international collaboration involving Prof. Mehdi Kargarfard (Iran), Prof. Jason Michael Cholewa (USA), and Prof. Jorge Pérez-Gómez (Spain). Currently, a Juan de la Cierva postdoctoral fellow at the University of Extremadura, Spain, I hold accreditation as a Profesor Contratado Doctorado and Profesor Privado by ANECA.

With a decade-long academic career, I served at prestigious universities worldwide, including the University of Freiburg (Germany), Coastal Carolina University (USA), University of Verona (Italy), and others in Spain, Portugal, and Iran. My teaching expertise spans fitness, football, physical activity, and health. Currently, I teach Human Physiology and Cycling at Universidad Europea de Madrid, Spain, and High Performance in Football and Basic Soccer at the University of Extremadura.

My research contributions have led to a top 0.2% global ranking among sports scientists and recognition as a top soccer scientist worldwide. My publication record includes 212 peer-reviewed articles, contributing to an H-index of 25 in Google Scholar and 18 in both WOS and SCOPUS. I co-authored 12 books and actively participated in over 70 international conferences.

I have secured funding for research projects, including regional, national, and international scientific projects, demonstrating leadership and responsibility. I've stayed at several universities globally, acquiring essential skills for a successful scientific career.

In technological and innovation activities, I collaborate with a Qatari start-up, contributing to AI in sports. We've completed projects with football clubs such as Sepahan and Persepolis (Iran) and teams from the Turkish and Brazilian premier leagues. My research outcomes are disseminated through TV, blogs, and social media, reaching over 15.8k followers on Instagram. I actively engage in lectures and courses for practitioners, athletes, and private companies.

I've played a significant role in mentoring young researchers, overseeing 12 Ph.D. theses, with five receiving the highest scores. I've also supervised 8 Master's theses and 12 undergraduate theses.

As a member of different research groups, including ACAFYDE, HEME, and the Physiology Research Group at the University of Extremadura, I manage work teams and an international network with over 500 top researchers from around the world (over 50 different countries based on Scopus data information).

Serving on the editorial boards of over 14 JCR-indexed journals, contributing 100+ reviews, and reviewing EU projects, I was honored as the best researcher at the International Congress on Sports Nutrition in 2017. I've also established research collaborations with various institutions in Spain.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | TATSUMI , ERI |
| **Referencia:** | RYC2023-043483-I |
| **Correo Electrónico:** | tatsumi.eri@jaxa.jp |
| **Título:** | Planetary Exploration by Spacecraft-based and Ground-based observations |

**Resumen de la Memoria:**

My research interest is minor bodies in the Solar System, such as asteroids, comets, trans-Neptune objects, because they keep extremely primitive materials on the Solar System, before configuring the planets. I would like to answer the question "Where do we come from? What are we? Where are we going?" through the minor bodies. Thus, I am enthusiastic about the life-forming materials over our Solar System. Especially dark carbonaceous asteroids are known to contain much water and organics. I have developed several techniques while building my research career, such as numerical simulation, image processing, telescope observations, and laboratory experiments.

The spacecraft missions are the best way to describe the real situation on the planetary bodies. I have been involved in several missions so far, Hayabusa2 by JAXA, OSIRIS-REx by NASA, Comet-Interceptor by ESA/JAXA, MMX by JAXA, and Hera by ESA. The asteroid sample-return missions Hayabusa2 and OSIRIS-REx have finished their proximity in-situ observations from 2018 to 2020. I have worked deeply on the calibrations and processing of the cameras onboard these missions. I have revealed the compositional distributions and evolutions on the asteroid Ryugu and Bennu based on the multi-band images. Currently, I am working on the Martian Moon Explorer (MMX), and Hera missions, which are currently preparation phase and will be launched in 2026 and 2024, respectively. My main contributions to these missions is leading the landing site selection activity, as well as the camera calibrations and the high-level product developments.

Furthermore, I have made laboratory experiments and simulations to support and demonstrate the hypotheses raised from spacecraft observations. I have experience in hyper-velocity impact experiments to simulate the cratering phenomena on asteroid surfaces. Additionally, I have done simulations of solar irradiation on the asteroid surfaces using the observed detailed shape models and the physical information obtained by the spacecraft in-situ observations. In this way, I tackled the important science questions of asteroids.

To give contexts of these space mission targets, I consider the ground-based observations are the key. The advantage of telescopic observations is that we can observe numerous targets, while the spacecraft cannot visit many targets at once. Thus, telescopic observations are crucial to understanding the big picture of the Solar System. I have been leading the observations of asteroids in near-ultraviolet (NUV) wavelength. The NUV wavelength is a complicated wavelength from the ground, but this wavelength is believed to have strong relation with hydration and organic compositions. There are no systematic spectroscopic observations in this wavelength so far, but I have established the observation technique and obtained ~120 asteroid spectra by large telescopes including 10.4-m GTC. Based on the observations, I reveal the life-forming material (water, hydrated minerals, organics) distribution in our Solar System.

Nevertheless, from the ground, it is impossible to observe <350 nm due to the atmospheric extinction. Especially organics has strong absorption in this wavelength. Currently, I am developing the instrument of NUV wavelength onboard the small space telescope IACSAT by IAC, which will open the door to new stage of understanding the origin of life.

**Resumen del Currículum Vitae:**

I obtained my bachelor's and master's degrees in Space Engineering Department at Kyoto University in Japan. I investigated rarefied gas dynamics with numerical simulation in Master thesis. In this way I built a foundation of computation. I started my career in Planetary Science at the University of Tokyo in 2012. I obtained my PhD in Planetary Science from the University of Tokyo in 2016. As the PhD theme, I designed and conducted the cratering experiments using the hyper-velocity impact facility at JAXA. This experiment is to understand the impact mechanism at the asteroid surfaces. After the PhD, I participated the Hayabusa2 mission especially in the camera team during my first postdoc. Before arrival, I led the plans and operations of inflight calibration of cameras onboard Hayabusa2. After arrival at the target asteroid (162173) Ryugu, I processed the multi-band image data. By making the global map of the asteroid, I contributed to decide the sampling site of Hayabusa2. Besides, I also contribute largely to archive the raw data to high-level products obtained by the cameras.

There is another mission to the asteroid (101955) Bennu by NASA, called OSIRIS-REx. Since the mission timeline was similar, there were a lot of interactions and exchanges of knowledge and people between the two missions. I have stayed in US and collaborated with the image processing working group in the OSIRIS-REx project. I have led also the project on characterizing exogenic materials on Bennu and on cross-calibration of multi-band imagers between OSIRIS-REx and Hayabusa2.

Based on these achievements through Hayabusa2 and OSIRIS-REx, I was awarded the Encouraging Young Scientist Award in Space Science in 2020 and JSPS Outstanding Young Scientist Award in 2021. These awards are one of the most prestigious awards in Planetary and Space Science in Japan.

Moreover, I have been involved in several international space missions such as JAXA's Martian Moon Explorer, ESA/JAXA's Comet Interceptor, and ESA's Hera. I have been working on the operational plan, image acquisition, calibration, and scientific analyses in these missions. Through these missions, I could construct worldwide interactions and collaborations with researchers around the world. Because of my worldwide mission experiences, I was promoted as a leader of Hayabusa2 Science Data Utilization team. From 2023 I am leading a international working group and developing products and tools for the Hayabusa2 science data in order to enhance the usability of the data.

Since 2019, I started the ground-based observations at Instituto de Astrofisica de Canarias (IAC), Spain. I learned how to observe and reduce the spectroscopic and photometric data obtained by the telescopes. I led proposals and have been awarded the time for my projects at several telescopes at Canary Islands and Mauna Kea Observatory from 2019 to 2023. At the same time, I am contributing to the design and evaluation of the optical system of the small NUV space telescope developed by IAC.

To date, I have published 9 papers (including Nature Astronomy and Nature Communications) as the first author and 68 papers as a co-author under international collaboration.

Not only research, I believe the education for students is very important for further development of the space missions. I have co-supervised several MS and PhD students so far.

**Área Temática:**    Ciencias físicas
**Nombre:**    SALVIONI , ENNIO
**Referencia:**    RYC2023-042775-I
**Correo Electrónico:**    E.Salvioni@sussex.ac.uk
**Título:**    New portals to the dark sector

**Resumen de la Memoria:**

I have made important contributions to several areas of theoretical physics beyond the Standard Model (BSM). The two fundamental questions driving my research are the microscopic nature of dark matter (DM), and the dynamics underlying electroweak symmetry breaking (EWSB). My trajectory started in particle phenomenology at the LHC, where I quickly achieved wide recognition in the physics of the Higgs boson and top quark. I introduced strategies to probe the Higgs in novel kinematic regions, thus resolving effects of potential BSM physics that would otherwise remain hidden. In top quark phenomenology, I started a new direction of research by proposing to test directly heavy-particle scattering processes to find BSM signals.

Later, in view of the experimental status after LHC Run 2, I led the development of Neutral Naturalness approaches to EWSB. I proposed groundbreaking models and analysed the light dark sectors that characterise this framework. Over the last years I expanded my research to DM physics, developing new scenarios that overcome the tensions with data faced by weakly interacting massive particles. Recently I have launched an interdisciplinary collaboration with cosmologists, aimed at testing the microscopic properties of DM with upcoming Large Scale Structure (LSS) data.

The experimental advances of the last decade have deeply transformed the theoretical landscape of particle physics, moving front and centre the idea that BSM physics may reside in a dark sector. The goal of my research programme is to push the theoretical and phenomenological exploration of dark sectors to a qualitatively new level. To achieve this, I will consider novel scenarios where the communication between the dark and visible sectors -the so-called portal- is provided by particles or forces of the SM, coupled to BSM physics by effective interactions. I will pursue two complementary tracks:
1)The heaviest SM particles as portals: top quark, Higgs boson, and Z boson.

First, I will maximise the power of LHC data to test the properties of the top quark, exploiting ultra-energetic scattering processes. Second, I will map the model space of DM interacting with the SM through the derivative Higgs portal, currently one of the most promising thermal scenarios, thoroughly evaluating the impact of next-generation direct detection data and the effects on collider observables. Third, I will enable novel LHC searches for Z boson decays to dark jet-type signatures, which have striking discovery potential only if the dedicated theory input from this project is delivered timely.
2)Gravity as a portal: probing the dark sector with Large Scale Structure.

This interdisciplinary track, at the boundary between cosmology and particle physics, will introduce a groundbreaking new class of constraints on dark sectors, derived from data of upcoming galaxy surveys. This will crucially establish what new information LSS can provide on BSM physics beyond the CMB. An end-to-end approach will be employed: starting from concrete particle physics models, after deriving the linear cosmology constraints, the major step of extending the analysis beyond the linear regime will be performed, thus allowing to calculate observables -such as the galaxy power spectrum- that can be compared to survey data. This is very timely, as the first data releases from DESI/Euclid are expected in 2024/2025.

**Resumen del Currículum Vitae:**

I am a theoretical particle physicist with leading expertise in physics beyond the Standard Model. In 2023 I was awarded an Ernest Rutherford Fellowship by the STFC (UK). This is one of the most prestigious grants in Europe, fully funding my independent research programme for 5 years (711 kGBP). It has also guaranteed me a permanent position at the U. of Sussex, where I have started in 2024 as Lecturer.

Previously, I carried out research at leading institutions in fundamental physics: as Assistant Prof. at the U. of Padua (2021-2023), Fellow at CERN (2019-2021), junior staff at the TU Munich (2016-2019), and postdoc at UC Davis (2013-2016). I obtained my PhD from Padua in 2013, with a 3-year doctoral fellowship at CERN.

I have made key contributions to physics beyond the Standard Model, publishing 34 articles in peer-reviewed journals, plus 2 preprints. My articles with at most 5 authors have received 1800+ citations, with h = 23. I have built a global network of collaborators based at leading institutions in Europe, N. America, and Asia: they are 20, counting the researchers with whom I have co-authored at least two papers. Including also 10+ working group reports, I have received 2700 total citations.

My impact on the LHC physics programme is demonstrated by the successful proposals of new strategies to probe the Higgs boson and top quark, which have been applied to data by ATLAS and CMS. Further evidence for my leadership in collider physics is my appointment in 2023 to the top governing body (Steering Committee) of the LHC Higgs Working Group, a joint Experiment/Theory platform where I coordinate the efforts of several hundred researchers.

Over the past few years I expanded my research to dark matter, both on the particle physics side and at the interface with cosmology. I have built a new bridge between the particle theory and Large Scale Structure communities, launching the workshop series "New physics from galaxy clustering" (3 editions so far). This adds to 5 other workshops and conferences I organised, and 8+ years of experience in running research seminar series.

I have given 37 invited plenary talks at international conferences and workshops, including many high-profile status reviews, and 42 invited seminars at institutions worldwide. I obtained two major research grants: the Ernest Rutherford Fellowship as PI, and a grant from the Italian MUR as national deputy PI and PI of the Padua unit (288 kEUR). I contributed to the physics case of future accelerators through high-impact working group reports. I regularly referee papers (40+) for major journals in the field. I obtained the National Habilitation to Associate Prof. in Italy (2018) and was awarded the Giorgio Bernardini Prize by the Italian Physical Society.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
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I have extensively mentored PhD students through collaboration and informally co-supervised two PhD theses (TU Munich 2020, 2021). I fully supervised two Master theses (Padua 2022, 2023), and co-supervised two more in Munich (2017, 2020). I was a reviewer and committee member for one PhD defence. I have a strong teaching record, focusing on methods and applications of Quantum Field Theory: I taught one Master course in Padua and acted as main assistant for three more in Munich. Moreover, I have experience in teaching at undergraduate level and I am active in outreach programmes, including International Masterclasses.

**Área Temática:** Ciencias físicas
**Nombre:** SEOANE BARTOLOME, BEATRIZ
**Referencia:** RYC2023-044759-I
**Correo Electrónico:** beaseobar@gmail.com
**Título:** Dinámica de sistemas desordenados

## Resumen de la Memoria:

La mitad de mis publicaciones se centran en el estudio de los vidrios de espín y en la caracterización de su física de equilibrio y fuera del equilibrio con precisión. El acceso a los superordenadores JANUS, nos ha permitido simular tamaños y tiempos nunca antes alcanzados en la literatura y convertirnos así en la referencia absoluta del campo. Junto con otros colaboradores, he escrito un capítulo sobre simulaciones numéricas en vidrios de espín publicado por World Scientific en 2023.

En el campo de los vidrios estructurales he realizado aportaciones muy importantes, en particular en lo que respecta al descubrimiento de la transición de Gardner. Esta transición había sido predicha en cálculos de dimensión infinita, pero su relevancia en sistemas físicos reales era bastante dudosa hasta que lo demostramos numéricamente en simulaciones de esferas duras. Mi trabajo ha motivado una gran cantidad de estudios experimentales posteriores tratando de imitar nuestros experimentos numéricos. La existencia de una fase de Gardner, análoga a la fase de vidrio de espín, explica de manera automática muchas de las anomalías observadas en sólidos amorfos con respecto a los sólidos cristalinos, de ahí su vital interés. Encontrar esta transición y caracterizarla era el objetivo de mi beca europea Marie Curie, y los resultados derivados de aquellos años me valieron un gran reconocimiento de la comunidad y la inclusión en la colaboración internacional Simons para "acabar con el problema vítreo".

Durante los últimos 5 años, y con más intensidad, desde que empecé mi carrera como investigadora independiente gracias al programa de "Atracción de Talento investigador" de la Comunidad de Madrid, mi investigación ha girado hacia la exportación de conceptos y técnicas de los vidrios a problemas fuera de la física, en particular, a la biología y a la informática. En el campo de la bioinformática he realizado importantes avances mostrando que la presencia de desorden estructural en proteínas está directamente relacionada con el modo en el que se ensamblan los complejos proteicos, o el desarrollo de técnicas para clasificar automáticamente secuencias por su función proteica o la generación de secuencias sintéticas con las características deseadas usando técnicas de inteligencia artificial y de física estadística.

Además, he realizado importantes avances recientemente en el campo de la inteligencia artificial, mostrando que los generativos basados en una energía (técnicas de aprendizaje automático no supervisado de tipo generativo) operan en dos regímenes muy diferentes dependiendo de que las cadenas de Markov usadas durante el entrenamiento hayan o no convergido al equilibrio. He mostrado que los modelos entrenados fuera del equilibrio (que son la mayoría en la literatura), sufren fuertes efectos de memoria y las funciones de energía obtenidas no pueden usarse para describir la distribución empírica de los datos usados durante el entrenamiento con gran precisión. Hemos descrito estos efectos tanto analíticamente como numéricamente en una variedad de modelos y bases de datos. Los resultados obtenidos estos últimos años han sido muy bien recibidos por la comunidad: hemos publicado en las dos conferencias más importantes y prestigiosas del mundo de IA y me han valido también mi puesto actual de Profesor Junior para Física del Machine Learning en la U. Paris-Saclay.

## Resumen del Currículum Vitae:

I am a researcher and since 2023 I have a junior professorship at the University of Paris-Saclay (a tenure-track position with the prospect of a full professorship), where I am setting up my research group at the University of Paris-Saclay (ranked 15th in the Shanghai ranking) in the Machine Learning Laboratory of the Department of Computer Science. I started my research career at UCM, where I wrote my PhD thesis under the supervision of V. Martin-Mayor and L. A. Fernández Perez in the Department of Theoretical Physics. My PhD thesis focused on the study of complex free energy landscapes, such as glasses and spin glasses. Then started a postdoctoral position (2012-2015) at La Sapienza University in Rome with G. Parisi (Nobel laureate 2021), where I continued my research on the statistical properties of glasses. In 2015, I obtained a European Marie Curie fellowship (2015-2017) (about 15% success rate in Physics, 179 k€) to continue my research at the École Normale Supérieur Paris with F. Zamponi as an independent researcher. In 2017, I decided to apply my expertise on glasses and spin glasses to the problem of disordered proteins, as a postdoc with A. Carbone at Sorbonne University (2017-2020). In 2020, I won an "Atracción de Talento" grant (399k€), with which I had the opportunity to set up my own research group at UCM, along with other grants I received. Finally, I obtained a tenure track for a full professorship at Univ. Paris Saclay in 2023. During this time I also obtained the certifications for PAD, PCD and I3 in Spain, wrote 47 publications and was invited to speak in 23 workshops/conferences/schools.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PEREIRO PEREIRO, IAGO |
| **Referencia:** | RYC2023-044685-I |
| **Correo Electrónico:** | iagopereiropereiro@gmail.com |
| **Título:** | Microfluidics for bioanalytical and biomedical applications |

**Resumen de la Memoria:**

I combine microfabrication techniques, micro-scale hydrodynamics and reaction kinetics to tackle existing problems in biomedicine and the life sciences. Two fruitful areas of research include:

(1)Microfluidic fluidized beds of paramagnetic beads, where I could prove that fluidization phenomena at the microscale is possible by leveraging opposing drag and magnetic forces and geometrical constrains in microfluidic chambers. I further demonstrated applications of such fluidized beds to detect single digit numbers of bacteria in liquid food, preconcentrate beta amyloids from spinal fluid or capture tumoral DNA for in situ amplification and mutation analysis.

(2)Microfluidic probes that create microscale laminar flows on surfaces to accurately control shear stress conditions, kinetics and sequential liquid exchange. I have shown that it is possible to adapt such probes for standard laboratory labware, and thus overcome molecular diffusion to largely enhance the kinetics of surface immunoassays, with large gains in information per assay and time to result. Other applications include hematology and since-cell manipulation.

My current research focuses on the formation and growth of human model systems, In particular organoids, in microfluidic devices with controlled hydrodynamic conditions and optimized mass transport of nutrients.

I also aim to positively influence my fields of research by providing perspectives and tutorial reviews on diverse topics: biopatterning, flow-based assays, bubbles in microfluidics.

Proposed line of research: In contrast to traditional 2D cell cultures, 3D cell culture can better mimic the cell environment, cell-cell interactions and tumor characteristics In particular, human model systems such as organoids could soon partly replace animal testing by better predicting human responses. However, such 3D model systems are complex and currently not sufficiently reproducible for most practical purposes. I aim to leverage my know-how in microfluidic probe technologies and human model systems to create technology to better address problems faced by current 3D cell culture development and analysis. Specifically, I propose work in two areas: (1) the application of local cues to spheroids and organoids during their development by localizing shear stress conditions and liquids containing morphogens at the micrometer scale at precise locations of their surface. This could enable the engineering of reproducible organoids at higher throughput and possibly new classes of organoids that are today not feasible. (2) Create new classes of microfluidic probes to extract individual or groups of cells from 3D cell culture structures at desired locations, hydrodynamically locating fluids at the single-cell level. Thus, whole spheroids or organoids could be deconstructed by removing single cells at will, which could then be individualized e.g. in droplets. This would enable a new paradigm of organoid analysis that could accurately reconstruct information such as changes in RNA expression with information both in time and in space.

**Resumen del Currículum Vitae:**

I graduated in Mining Engineering (specialized in materials) and a master's in Applied Physics at the University of Vigo, before continuing with a master's degree in Nanosciences at Paris Saclay in France. I then did my PhD studies at the Institut Curie in Paris, under the guidance of Jean-Louis Viovy, one of the pioneers of microfluidics for biological and biomedical applications. Our laboratory was thentransferred to the new Institut Pierre-Gilles de Gennes for microfluidics, where I stayed for one year postdoc. Afterwards I was a postdoc at IBM – Research in Zürich for over four years in the group of Emmanuel Delamarche, continuing my work on lab-on-a-chip and microfluidic systems for biomedicine. Since January 2022 I am a staff research scientist at the Roche Institute of Human Biology, a new institute head by Matthias Lütolf at the interface between academia and industry, aiming to translate cutting-edge technology in human model systems for translational bioengineering applications and drug discovery.

Output: My work has been published in >25 peer reviewed articles, 3 book chapters and presented at >15 international congresses. This research has led to 9 patent applications, 4 already granted. Specifically, I have worked on patent creation and the translation of my technology with 3 multinational corporations: IBM, BioRad and Roche.

Collaborations: Internationally, I closely collaborated with the SciLifeLab in Stockholm (Sweden) and the University of Pardubice (Czechia), resulting in 3 peer-reviewed publications. During my time at the Curie Institute (France), national collaborations resulting in publications include with Université Paris-Sud, Université Paris Descartes, ESPCI and Institut Pasteur. During my time at IBM (Switerland) I created intellectual property with BioRad's research center in France, published joint work with ETH Zürich, and co-directed students from EPFL.

Leadership: During my time at IBM, I was the scientific lead of an IBM-Biorad joint development agreement, attended business decision meetings with upper management and coordinated the research between research sites in France and Switzerland. I participated in three 7th Framework Programme projects as a researcher, international meetings and work package reporting. As a postdoc I had a large degree of autonomy, allowing me to guide the direction of my work and proposing new projects. I was corresponding author of 2 peer-reviewed publications. At Roche's Institute of Human Biology, I am a project lead supervising a group of 3-4 people. I further helped establish new lab spaces and a clean room, and the hiring of the leadership team.

Recognition: Best Paper Award at MicroTAS 2020 conference. Two IBM patent application awards. Jury Prize Certamen Arquimedes 2010.
First candidate in reserve list of Ramón y Cajal 2022 program, in Physics section.

Responsibility: As a researcher, I have been responsible for academic and industrial research lines, including supervising 6 students. Project planning at both IBM and Roche, including with external consulting companies.

**Resumen de la Memoria:**

My research is mainly focused on gravitational physics, with an emphasis on models and dynamics of black holes and neutron stars. One of the most important questions I am trying to answer in my work is how we can test fundamental physics through astrophysical and especially gravitational wave observations. This includes tests of different modifications of general relativity motivated by quantum gravity, cosmology, and the accelerated expansion of the universe, probing dark matter candidates on astrophysical scales, and exploring the high-density nuclear matter equation of state. The astrophysical phenomena I focus my research on are mergers of binary neutron stars and black holes that are among the loudest gravitational wave events, stellar core collapse that leads to the formation of new neutron stars or black holes, gravitational wave emission from extreme mass-ratio inspirals that are ones of the primary sources for the space mission LISA, binary pulsars that give for the moment some of the best constraints on modified gravity, and accretion disks around compact objects. The final goal is to confront these theoretical findings against electromagnetic and gravitational wave observations in order to constrain the underlying astrophysical models and fundamental physics theories.

Some of my main research achievements are: The discovery of new classes of beyond general relativity (spontaneously scalarized) black holes and the construction of the first rapidly and differentially rotating neutron stars in modified gravity. They opened up the possibility of testing new sectors of beyond-GR theories; The discovery of new observational effects in the gravitational wave signal of compact binary black hole and neutron star mergers: gravitational wave afterglow lasting for minutes or even hours after a binary neutron star merger and due to rotational instabilities, and gravitational phase transition between disconnected phases of black holes and neutron stars in modified gravity.

My future line of research will be mostly focused on exploring the potential of gravitational waves to test fundamental physics through observations of some of the most violent events in the universe - compact binary mergers and stellar core collapse. The electromagnetic counterparts of these events will be also investigated. In comparison with my previous work, I will move from the model proof of principle investigations to realistic astrophysical viable scenarios. The goal is to eventually produce theoretical models ready to be confronted against observations. This will be done through the means of numerical relativity simulations and machine learning (surrogate)techniques. More specifically, I will identify qualitatively new and easily traceable gravitational wave signatures appearing in some modified theories of gravity or for dark matter endowed black holes and neutron stars. I also plan to develop gravitational waveform catalogs for binary black hole mergers in modified gravity. By confronting the resulting waveform models against observations, a new understanding of the underlying theories of gravity will be acquired and the dark matter candidates under consideration will be constrained. The developed methodology will pave a new path for testing fundamental physics theories including effective field theories, beyond standard model physics, and quantum gravity.

**Resumen del Currículum Vitae:**

I defended my PhD thesis in 2012 at the University of Sofia (USof). Afterward, I moved to the University of Tübingen (UTüb) for a series of research positions. This includes the Alexander von Humboldt fellowship and 5-year Margarete von Wrangell habilitation fellowships. In 2015 I was awarded also an Ellite Programme for Postdocs grant by the Baden-Württemberg Foundation that allowed me to consolidate my own junior research group. In 2019 I was successful in applying for the prestigious Emmy Noether program, which is similar to an ERC starting grant in terms of success rate and granted amount but local for Germany.
In 2021 I was awarded a membership at the Elisabeth-Schiemann-Kolleg, a prestigious mentoring network of the Max Planck Society aiming to foster the careers of excellent female scientists. I am an active member of the LISA Consortium and the Einstein Telescope Observational Science Board. I was a core group member or management committee member of 3 COST Actions (MP1304, CA15117, CA16214).

I have published 90 papers, that attracted more than 6000 citations. My h-index is 38 (source INSPIRE-HEP). Out of these papers, 4 are in letter journals and 2 are review articles in Rev. Mod. Phys. and Nature Astronomy. I am the first author and leading scientist in 36 of them, and another 26 were completed by PhD students and postdocs that I supervised. 9 papers are many authors review ones and in half of them I was a coordinator or section leader. Prominent outreach activities are an interview given for the Bulgarian National Television(2023) and an invited popular article by APS Viewpoin(2021).

My research focuses on models and dynamics of black holes and neutron stars as a tool for testing fundamental physics through astrophysical and especially gravitational wave observations. This includes tests of different modifications of general relativity motivated by quantum gravity, cosmology, and the accelerated expansion of the universe, probing dark matter candidates on astrophysical scales, and exploring the high-density nuclear matter equation of state.

I gave invited or plenary talks at 26 conferences and I was a panelist at 4 conferences. I was invited to give a talk at 21 seminars and colloquia. I was a co-organizer of 1 school, 2 conferences, and 1 conference session. I am a reviewer for most of the major refereed journals in the field (e.g. PRL, PRD, CQG, MNRAS, ApJ); and a referee for several national funding agencies.

I was awarded the 2024 Gustav-Hertz-Preis for young scientists of the German Physical Society. In 2018 I got the Pythagoras Grand Prize for Young Scientists by the Ministry of Science and Education of Bulgaria.

My collaboration network significantly expanded in the past few years, including scientists from the University of Valencia, Queen Marry University of London, University of Heidelberg, University of Thessaloniki, University of Madrid, the Max Plank Institute for Gravitational Physics, etc.

Currently, I supervise 1 PhD student at UTüb and co-supervise 2 PhD students at the UTüb and USof. In the past, I supervised or co-supervised 4 PhD students, 1 postdoc, and 6 master students at the UTüb and USof.

I taught a number of courses at the UTüb. Special attention deserves the Black Hole Physics course that I developed for the first time at the university. It attracts an increasing number of students.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PICCINNI , ORNELLA JULIANA |
| **Referencia:** | RYC2023-044489-I |
| **Correo Electrónico:** | ornellajuliana.piccinni@gmail.com |
| **Título:** | DANCE - Detection Analysis methods for continuous gravitational wave signals from newborn Neutron stars and Compact Exotic objects |

**Resumen de la Memoria:**

My research line can be divided into two areas: data analysis methods for the search of the yet undetected continuous gravitational waves and dark matter candidates (algorithms, parameter estimation, etc.); and detector characterization of the Virgo interferometer, contributing to the study of spectral noise artefacts present in the data. I am also involved in many activities of the future 3G detector Einstein Telescope. In this context, I contribute to the scientific organization of the collaboration by participating in many of the Scientific divisions.

Continuous gravitational waves are long-lived and quasi-monochromatic signals typically emitted by fast asymmetric spinning neutron stars, either isolated or with an accreting companion. Even though several emission models have been studied, the actual factors triggering the star asymmetry are not completely clear. Indeed, these deformations are strongly related to the inner core equation of state of the star, where extreme densities are expected to exist, and the actual physical condition of matter is impossible to study with currently running high-energy physics experiments. The detection of a signal from such systems could provide an interesting tool to probe some of these unanswered questions in fundamental physics.

Potential dark matter candidates such as ultra-light bosons, including dark photons or QCD-axions can be also investigated with Earth-based detectors. Indeed, although neutron stars and dark matter candidates are completely different sources of continuous waves, the same methods, originally developed for the search of gravitational waves from neutron stars, can be applied in dark matter searches.

Two main targets have been searched for in this context: annihilating bosonic particles clumped around spinning black holes due to superradiance, and the ensemble signal produced by the direct interaction of vector bosons with the detector itself. Future research lines foresee the improvement of existing methods and the extension of CW methods to continuous transient searches from primordial black holes signals with masses below $10^{-2} M_\odot$.

In the long-term plan, I expect to fill the gap between CW and CBC signal searches, specifically targeting the so-called transients CWs. The goal of this project is to develop new and improved tCW detection techniques, reaching an astrophysical horizon of several Mpc. The specific sources that will be considered are newborn neutron stars (NS, magnetars), boson stars and pairs of dark compact objects like primordial black holes (PBH). Already existing methods for the search of standard CWs can be adapted and tailored for the case of the sources considered in this proposal. The main data analysis framework that will be used is the Band-Sampled-Data, the outcome of my PhD. Part of the research project will be carried out within the LVK collaboration and real detector data from the O4 run will be used. In the case of detection during O4, this project will have a strong impact in several fields of science: in gravitational wave astronomy (e.g., first GW detection of a post-merger signal, first GW detection of a CW signal), in astrophysics (e.g., the first evidence of GW signals from a magnetar) and in nuclear and particle physics (e.g., NS interior constraints, evidence of dark matter existence).

**Resumen del Currículum Vitae:**

I am a postdoctoral researcher at the Institut de Fisica d' Altes Energies (IFAE) of the Autonomous University Barcelona since February 2022. I am a member of both the LIGO-Virgo-KAGRA (LVK) and Einstein Telescope (ET) collaborations. I worked in gravitational wave (GW) data analysis since my master's thesis project in 2014, conducted at the Max Planck Institute, Hannover. I defended my PhD at Sapienza University in 2018 and collaborated with the INFN Rome Virgo group, as a postdoctoral researcher and as an Amaldi Research Center fellow until 2021. In 2021, I conducted my research project funded by the L'Oréal – UNESCO fellowship, earning the prestigious "For Women in Science" prize. This achievement garnered significant press coverage, with over 40 articles and features in online journals. As a member of the LVK, I share the Breakthrough, Einstein Medal, and Gruber prizes.

I am a GW researcher active in the field with important contributions (including leadership roles) both within the LVK collaboration and as an independent researcher. My research focuses primarily on the exploration of continuous GW signals emitted by neutron stars (NS) and potential dark matter (DM) sources. I developed several search algorithms for the detection of these signals, including those aiming at non-canonical CWs (DM candidates), such as boson clouds around spinning BH or dark photons interacting directly with the detector mirrors. I am the main developer of algorithms targeting these sources, built on top of the data analysis framework I created (the Band-Sampled-Data).

I had several leading roles in the observing run O3 and now in the current O4 run. These projects resulted in publications in top international journals. Among these, I led the O3 search for CWs from NSs and boson clouds in the Galactic center, published in PRD. I was the sole data analyst and paper-writing team leader. I also played a significant role in other 3 LVK papers. For the ongoing O4 run, I am leading two and co-leading one LVK paper in addition to my usual contribution in O3 as an analyst.

I have had important responsibilities in the DetChar Virgo team since 2014. Additionally, I serve as the liaison between DetChar and the CW group. I am a member of the CW detection committee in the LVK. I was part of the Virgo Steering Committee, and I am part of the Virgo Editorial Board.

On top of my leading roles in the LVK (to which I dedicate 70%), I also amass an internationally recognized independent production of 23 papers. My expertise is in high demand within the gravitational wave community, and it led me to the publication of an invited review about CW searches.

My contribution to the field is not only limited to CWs, indeed I contribute to the characterization of the instrumented baffles for the Virgo detector and participated in projects that test binary BH environments.

I have supervised more than 10 students in various projects, including master/bachelor/PhD theses. I delivered 6 invited talks at international conferences such as PIC2022, and TeVPA2021 and more invitations are scheduled for 2024. I contribute to reviews and technical reports, such as those for the newly formed ET collaboration. I am already actively participating in many ET Observational Science divisions. I have a vast outreach engagement totalling more than 30 invited contributions.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | RUIZ LARA, TOMÁS |
| **Referencia:** | RYC2023-043063-I |
| **Correo Electrónico:** | ruizlara@ugr.es |
| **Título:** | Zooming in on the formation and evolution of galaxies |

**Resumen de la Memoria:**

The study of stars in the faintest systems (i.e. outskirts of external galaxies or low surface brightness galaxies) and the most nearby systems is of great importance to unveil how galaxies form and evolved. On the former, their lower gravity, longer dynamical timescales, or dark matter dominance provide key insights on galaxy formation and evolution, as well as on the cosmology of our Universe. On the latter, unprecedented resolution, together with unrivalled data quality and spatial coverage, are recently enabling the most detailed characterisation of galactic systems up to date (the MW and the Local Group, LG). The information we have at hand to study stars in these two regimes are drastically different. For external galaxies, we rely on unresolved, integrated light, while to study resolved systems, individual stars can be studied. In my career I have been bridging the gap between the resolved and unresolved realms, with the goal of providing a complete and faithful scenario of how galaxies form and evolve. This gives me an unusual interdisciplinary profile that is very valuable to reach a unified understanding of galaxy evolution combining the advantages of both approaches

Among my most relevant scientific contributions I can name: i) the lack of correlation between age and light profiles in spiral galaxies (Ruiz-Lara et al. 2016); ii) confirmation of the validity of full spectral fitting techniques to characterise integrated stellar populations (Ruiz-Lara et al. 2015; Ruiz-Lara et al. 2018); iii) first star formation histories of ultra diffuse galaxies confirming their dwarf origin (Ruiz-Lara et al. 2018); iv) unveiling events in the early history of the Milky Way (Gaia data, Gallart et al. 2019) or the Local Group galaxies (Ruiz-Lara et al. 2020; Ruiz-Lara et al. 2021); v) role of Sagittarius dwarf in the build-up of our Galaxy; and vi) first star formation history of a disrupted galaxy accreted by the Milky Way (Ruiz-Lara et al. 2022). All this work has led to the publication of 58 Q1 refereed papers (h-index 27), 13 as first author and 10 as 2nd-3rd author. Some of these publications appeared in the highest impact journals (twice in Nature, twice in Nature Astronomy). Furthermore, my research has been echoed in hundreds of media outlets, and I have participated in many interviews, including Science documentaries produced by BBC, PBS, and Japanese NHK. I have also acted as scientific referee in more than 10 Q1 articles.

During this Ramón y Cajal action (if awarded) I will provide a consistent and comprehensive ' zoom-in' (from external galaxies to the Milky Way) view on galaxy formation and evolution via Star Formation Histories, the link between the light we observe from galaxies and their past and present properties, using a unique approach merging CMD-fitting techniques (resolved stars in Local Group systems) and full-spectral fitting methods (integrated stellar content in unresolved galaxies).

**Resumen del Currículum Vitae:**

I got my PhD from the University of Granada (UGR, February 2016, highest honours, 12 months of stays abroad). I then built my post-doctoral education at the Instituto de Astrofísica de Canarias (IAC) before moving to the Kapteyn Astronomical Institute (The Netherlands) to consolidate my international career, working within one of the world leading groups in Galactic Archaeology (led by Prof. A. Helmi). I am currently a Juan de la Cierva Incorporación fellow at the UGR, where I play a leading role in the CAVITY international team dealing with many scientific and managerial tasks including Project Scientist and outreach coordinator. In these 12 years in the field I knitted a solid web of international collaborations by means of abroad stays, active participation in international surveys (CALIFA, AMUSING, WEAVE-Apertif, SMASH, CAVITY...), and attendance/organization of conferences (1 invited talk, 12 talks, 5 posters, 2 SOCs, 2 LOCs). This is reflected in the international participation in my publication list. So far, I have earned several prestigious fellowships such as the FPU PhD fellowship, the IAC fellowship (a 3-year independent postdoctoral fellow), and the Juan de la Cierva – Formación and Incorporación fellowships, working in some of the most prestigious worldwide institutions (IAC, Kapteyn Institute). I have also been supervisor of several bachelor and master theses, as well as a PhD thesis currently in progress. My compromise with the science communication (see C6), my role as referee for international journals, and my wide observing (as PI as well as co-I) and teaching (20 ETCs) experience are other important aspects to highlight.

I have a mature, independent, and complete research profile specialised on the formation and evolution of disc galaxies from the crucial scope of studying their stellar component. I possess a unique expertise merging resolved and integrated studies, as well as determining star formation histories from Gaia data. My set of skills includes: i) reduction and analysis of integrated spectroscopic data; ii) characterisation of the stellar populations and kinematics in external galaxies (integrated light); iii) computation of star formation histories in Local Group galaxies analysing deep colour-magnitude diagrams (Hubble Space Telescope and Gaia); iv) handling of vast amounts of data (Gaia, SMASH, big data); v) cosmological simulation analysis; and vi) analysis of integrals of motion and dynamics of Milky Way stars. These skills give me a multidisciplinary research profile to unveil the formation and evolution of galaxies in a "zoom-in" approach, from external systems in different environments to our Milky Way.

**Área Temática:** Ciencias físicas
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**Referencia:** RYC2023-043804-I
**Correo Electrónico:** carlosvsierra@gmail.com
**Título:** New approaches to search for BSM and Higgs physics

**Resumen de la Memoria:**

I worked on one of the key objectives of the LHCb physics program, the study of CP violation in the heavy-flavor sector, as part of my PhD thesis.

After the first two years of my career, I started to become interested in direct searches for new physics at LHCb: even if originally designed as a heavy-flavor physics experiment, I have realized its enormous potential as a general-purpose detector in the forward region.

In the following years, I devoted my work to expand the scope of the LHCb physics program in this direction. In the last 5 years, I have conducted phenomenology studies with theory colleagues, in potential searches for new physics and dark matter at LHCb, and I am an editor of a major report on Stealth new physics at the experiment, following a dedicated theory-experimental workshop I coordinated in 2020 at Santiago de Compostela. This year, I am also involved in SM Higgs measurements.

I was a "QCD, Electroweak and Exotica" physics working group convenor of the LHCb Collaboration, from 2020 to 2022, having the responsibility to coordinate and review all the WG analyses: electroweak studies and cross-section measurements, fundamental QCD analyses, new physics searches, and central exclusive production measurements.

I am, since 2022, a coordinator of the LHC Exotic Higgs decays working group. I was also a coordinator of the LHC LLP working group, until 2023, and I organized >10 workshops on this topic, one of them at my home institution, and published a major report and a document on recommendations for the development of dedicated triggers for the LHC Run 3.

I am also the deputy Physics Coordinator, since 2021 of a new experiment to be installed in the LHCb cavern to search for very long-lived particles and complementing LHCb, CODEX-b. I am involved in its physics program and in the preparation of CODEX-$\beta$, a demonstrator to be installed during the LHC Run 3 and approved as a time-limited LHCb R&D project.

Moreover, I worked in the upgrade of the LHCb Vertex Locator from the very beginning of my career and made crucial contributions in terms of computing and software: trigger, simulation, and offline data processing. I coordinated the offline data processing of LHCb from 2018 to 2020, leading a very successful legacy campaign where all the data recorded since 2011 has been re-processed, a very delicate and complicated task where I put a significant amount of my effort. I was part of the creation task force of the Data Analysis & Preservation (DPA) project in LHCb, and I contributed to the Open Data efforts of the collaboration.

**Resumen del Currículum Vitae:**

I am a "María Zambrano" postdoctoral researcher at the University of Santiago de Compostela (USC), since December 2022, where I am an experimental particle physicist in the LHCb Collaboration. I was a Senior Research Experimental Fellow at CERN from 2020 to 2022.

I was a postdoctoral researcher at the Dutch National Institute for subatomic physics (Nikhef) from 2017 to 2020. I spent more than 6 years of my postdoctoral career at very prestigious international institutes.

I obtained my PhD degree in Particle Physics (cum laude with international doctorate mention) in 2016, at the USC and in collaboration with the IGFAE, spending about 6 months of my PhD period at CERN.

My research career started in 2012, when CERN selected me as a summer student for a period of 13 weeks, and I joined the LHCb Collaboration for the first time.

I am an author of more than 570 LHCb publications (4 as key contributor), some of them with more than 1000 citations. I am author of more than 10 publications outside of the LHCb collaboration, some with > 200 citations, and some published in a journal with an impact factor of 17.264 (ROPP).

I have been involved in many institutional LHCb reviews, as referee for journals such as EPJC, JHEP and PRD, and I have been invited to present my work in many conferences and workshops, such as ICHEP, LHCP, EPS and Moriond, among others. I was involved in the organization of more than 10 workshops and conferences, coordinated the BSM-2 session of LHCP 2020 and LHCP 2024, and member of the Program Committee of Higgs 2023.

During my career, I have been part of two international projects (with a budget superior to 1M €) and various Spanish national project as a researcher, and I have obtained a "Juan de la Cierva-incorporación 2019" fellow and a "Beatriu de Pinós 2021" fellow, both declined in favor of the CERN fellowship and my current position, respectively.

This year I am PI of a Generación de Conocimiento 2022 project, "New approaches to find BSM physics searching for Long-Lived Particles". I am also an international referee for the National Science Council of Perú (CONCYTEC), and member of the "banco de expertos" of the Agencia Estatal de Investigación (AEI).

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | CAVALETTO , STEFANO MICHELE |
| **Referencia:** | RYC2023-044186-I |
| **Correo Electrónico:** | smcavaletto@gmail.com |
| **Título:** | Exciting, monitoring and controlling ultrafast charge transfer in molecules by broadband x-ray pulses |

**Resumen de la Memoria:**

The redistribution of electronic charges in light-excited molecules and materials plays a crucial role in key chemical and biological processes. Novel sources of ultrashort x-ray pulses such as, e.g., free-electron lasers (FELs) offer completely new opportunities for monitoring and ultimately controlling ultrafast charge-transfer dynamics in molecules. With their unprecedented intensities and attosecond durations, x-ray FEL pulses allow novel time-resolved x-ray spectroscopy experiments with high temporal resolution and element specificity.

During my PhD and postdoc in Germany, I studied theoretical schemes to improve the coherence properties of existing x-ray sources, gaining expertise in the simulation of stochastic FEL pulses and their interaction with atomic systems. During my subsequent postdoctoral positions in the US and Denmark, I applied this expertise to investigate ultrafast dynamics in larger, more complex systems. I have investigated a broad range of time-resolved x-ray spectroscopy signals, which I have applied to monitoring nonadiabatic dynamics in molecules and strong-field dynamics in solids.

I now plan to lead an independent theory research line on "Exciting, monitoring and controlling ultrafast charge transfer in molecules by broadband x-ray pulses". The project will be at the forefront of current developments in ultrafast x-ray spectroscopy, bringing together my expertise in x-ray FEL science, the simulation of stochastic FEL pulses, and the design and simulation of state-of-the-art nonlinear x-ray spectroscopy signals. I will study molecular compounds of interest in photochemistry or in the development of new light harvesting devices, such as macrocycle organic compounds and donor-acceptor complexes. I will systematically investigate different excitation schemes for initiating charge transfer in molecules, and I will develop the necessary theoretical methods to simulate the subsequent coupled electronic and nuclear dynamics and the ensuing charge transfer between different molecular regions. For a direct observation of my findings and to motivate and guide future experiments, I will systematically investigate state-of-the-art spectroscopy signals employing x-ray FEL pulses. Furthermore, I will study control schemes employing intense FEL pulses to optimally manipulate the charge transfer and the ensuing molecular dynamics, for controlling chemical reactions on the attosecond timescale.

My extended network of theory and experimental collaborators will allow me to effectively identify the most promising systems and techniques and ensure a rapid observation of my results. As a (co-)supervisor of PhD and BSc students, I could independently identify projects that led to publishable results. These supervision experiences will allow me to effectively guide the researchers who will join my group. The expertise I gained in writing two successful postdoctoral applications will allow me to prepare strong applications for fundings from Spanish and European sources for computational resources and for dissemination costs.

**Resumen del Currículum Vitae:**

I am a theory expert in the simulation of ultrafast laser-induced dynamics and time-resolved optical and x-ray spectroscopy. With funding from individual postdoctoral fellowships (a Marie Curie fellowship and a Feodor Lynen fellowship of the Humboldt Foundation), I have investigated a very diverse range of systems, from atoms and ions to more complex molecular and solid-state systems. I have 31 peer-reviewed publications, including first-author papers in Nature Photonics, Phys. Rev. X, and PNAS. I have published 10 papers as first, 2 as co-first, and 2 as last author. According to Scopus, I have 462 citations and an h-index of 11. My work involves analytical modelling and numerical ab-initio calculations using my own as well as publicly available software packages.

I obtained my PhD in 2013 in the theory division of Christoph H. Keitel at the Max Planck Institute for Nuclear Physics in Heidelberg, Germany, working on schemes to optically control x-ray spectra in atoms. During my subsequent postdoctoral stays, I gained expertise in the simulation of more complex molecular and solid-state systems, of relevance for current ultrafast spectroscopy studies with femto- and attosecond x-ray pulses. In 2018, with funding from the Humboldt Foundation, I joined the group of Shaul Mukamel at the University of California, Irvine, USA, to develop a project on the simulation of nonlinear x-ray spectroscopy signals monitoring ultrafast dynamics in molecules. In Irvine, I had key contributions to the field of stochastic-light spectroscopy. In 2021, I obtained a Marie Curie fellowship to join the group of Lars B. Madsen at Aarhus University, Denmark, to lead my project on the time-resolved spectroscopy of strong-field-excited solids. Since October 2023, I have been a postdoc in the group of Fernando Martín at the Universidad Autónoma de Madrid, Spain, where I am applying my expertise in light-matter interactions to study new molecular systems and excitation schemes.

I have collaborated with experimental groups for joint projects, publications, and proposals, in many cases independently of my PIs. In Heidelberg, I have led a collaboration with the experimental division of Thomas Pfeifer on transient absorption spectroscopy, with joint publications in Phys. Rev. Lett. and Nature Communications. In Irvine, I have led a collaboration with the experimental group of Daniele Fausti (FERMI, Trieste) with a joint publication in Light Sci. Appl. I have contributed to 5 proposals for experiments at free-electron lasers, in one case as co-PI.

As a (co-)supervisor of PhD and BSc students, I could independently identify projects that led to publishable results. In Heidelberg, I have co-supervised a PhD student, Chunhai Lyu (2014-2018), leading to a publication in Sci. Rep. with me as sole corresponding author; and I have independently supervised two visiting BSc students, Vadim Becquet (2016) and Juliane Haug (2018), leading to corresponding publications with me as last author. In Aarhus, I have co-supervised Kristian K. Nielsen's BSc thesis (2023) on a project which I conceived.

I have given 43 presentations (32 talks and 11 posters), including 9 invited seminar talks and 7 invited conference talks. I have participated in outreach events aimed at the general public. I have been Reviewer for leading physics and chemistry journals, and Guest Editor for PNAS.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | BLANCO DE TORRES, CELIA MARÍA |
| **Referencia:** | RYC2023-045781-I |
| **Correo Electrónico:** | cmblancodetorres@gmail.com |
| **Título:** | Exploring the Origin and Evolution of Early Life: A Theoretical and Computational Approach |

**Resumen de la Memoria:**

I am an interdisciplinary researcher committed to gaining a deeper understanding of the physical, chemical and evolutionary processes that may have existed in the early stages of life. I approach this understanding from a theoretical perspective, using computational methods and simulations to support my findings. I am particularly driven by exploring chemical and biological systems that not only hold significance in unraveling the evolution of early life on Earth, but also have significant practical implications.

During my Ph.D., I studied the mechanisms that could have led to the emergence of homochirality in the molecules of life from a theoretical point of view, using mathematical modeling, theoretical analysis, and computational simulations. I worked on a new line of research investigating the conditions under which certain chemical models can amplify small, stochastic enantiomeric excesses at the monomeric level or transmit it to the supramolecular level. This research required strongly multidisciplinary collaborations with laboratories dedicated to experimental chemistry. I was awarded the Extraordinary Ph.D. award in Physics at Universidad Complutense de Madrid.

In 2014, I moved to the United States to join the group of Prof. Irene Chen at the University of California, Santa Barbara (UCSB) as a Postdoctoral Researcher. I studied the fundamental properties of the interaction between proteins and RNA and applied the results to assess the relevance of prebiotic scenarios. Improving my coding skills and learning bioinformatics led to many fruitful collaborations with experimental groups analyzing data from in vitro selection of catalytic RNA. It also laid the foundation for my subsequent line of research, as in 2016, I received the Otis Williams Postdoctoral Fellowship to investigate the emergence of catalytic activity in peptides and proteins using sequencing data from directed evolution experiments. Thanks to this fellowship, I established a long-lasting collaboration with the experimental group of Prof. Burckhard Seelig at the University of Minnesota. This ongoing collaboration has resulted in several publications (including a method to reduce the cost of sequencing and two open-source bioinformatic tools) and has secured funding as a research team.

In 2020, I joined the University of California Los Angeles (UCLA) as an Assistant Project Scientist. I explored the role of multilamellarity in enhancing permeability differences in a membrane protocell, while also continuing my work on developing bioinformatic tools for mRNA sequencing data analysis.

In 2021, NASA selected me as a co-Investigator for one of its interdisciplinary ICAR research teams. Our team was awarded a 5-year grant to investigate the emergence of the translational system. This grant allowed me to establish my own line of research as an independent researcher at the Blue Marble Space Institute of Science.

My overall goal is to gain a better understanding of the mechanisms that led to the emergence of life and drove its early evolution. In the coming years, I will explore such mechanisms from a theoretical perspective, focusing on evolutionary aspects of the emergence of the genetic code.

**Resumen del Currículum Vitae:**

After graduating in Physics, I was awarded a competitive predoctoral fellowship (FPI Rafael Calvo Rodés) from the Spanish National Institute for Aerospace Technology (INTA) to perform my Ph.D. at Centro de Astrobiología (CSIC-INTA), a highly interdisciplinary center of excellence associated with the NASA Astrobiology Program in Madrid. I was awarded the Extraordinary Ph.D. Award for the best thesis in Physics at Universidad Complutense de Madrid.

I joined the University of California, Santa Barbara (UCSB) as a Postdoctoral Researcher, and I was awarded the Otis Williams Postdoctoral Fellowship (75k USD). I was also a finalist for the Harvey L. Karp Discovery Award and the PCCP Emerging Investigators lectureship. My research proposal for the Marie Sklodowska-Curie action was awarded the seal of excellence by the European Commission (without funding). I later became an Assistant Project Scientist at the University of California, Los Angeles (UCLA). I am currently an Affiliate Research Scientist at Blue Marble Space Institute of Science (BMSIS) and a co-Investigator in a 5-year NASA Interdisciplinary Consortia for Astrobiology Research (ICAR) grant (~5M USD).

My scientific career has resulted in 29 publications, including 3 comprehensive reviews, 3 book chapters, and 1 perspectives article. My work has been published in top multidisciplinary journals such as Nature Communications, Current Biology (2x), Scientific Reports, Astrobiology, Physical Chemistry and Chemical physics (6x), ChemPhysChem (2x), etc. I am the first author in ~66% of my publications. I published 3 open-access bioinformatic tools to analyze sequencing data. I have been awarded the R3 certificate, which recognizes my status as a well-established researcher.

I participated in 10 research projects (8 in the United States and 2 in Spain): 2x National Aeronautics and Space Administration (NASA), 2x Simons Foundation, Sloan Foundation, National Science foundation (NSF), National Institutes of Health (NIH) and US Army, Santa Barbara Foundation and 2x Spanish 'Ministerio de Ciencia e Innovación' (MICINN). I have been Executive Secretary and grant evaluator of the 'Biosignatures Rolling Evaluation Panel' (REP) for 'NASA's Exobiology' (EXO) Program. I am also a grant evaluator for the National Science Foundation Graduate Research Fellowship Program (GRFP).

I presented my work at 20+ international events, and was awarded 'best poster' in two of them. I am a chair at convener at AbSciCon, the biennial most important international conference in astrobiology. I regularly review articles for journals (e.g. PCCP, Nature) and I have guest-edited two special

issues in the Life. I have mentored 5 graduate students, 1 undergraduate student, and 1 high school student (summer project). I currently have 4 students working under my direct supervision as Research Affiliates. I am also an auxiliary mentor for the National Science and Technology Medals Foundation.

In addition to my research pursuits, I am actively engaged in diverse mentoring programs where I offer guidance and support to aspiring scientists. I am also committed to science communication and outreach, predominantly in the field of astrobiology as well as general science. I am an active member of the NASA Astrobiology Science Communication Guild and a writer for the SAGANet Newsletter (>1k subscribers).

**Área Temática:** Ciencias físicas
**Nombre:** WIELGUS , MACIEJ
**Referencia:** RYC2023-042988-I
**Correo Electrónico:** maciek.wielgus@gmail.com
**Título:** Astrophysics of black holes

**Resumen de la Memoria:**

I am a researcher specialising in radioastronomy and physics of black holes. Through my work I gained a significant level of expertise in these fields, particularly regarding radiointerferometry and observational tests of the theory of gravity. My main contributions to science are related to my work within the Event Horizon Telescope (EHT) Collaboration since 2017. The EHT is a global array of radiotelescopes forming together a virtual antenna of a diameter of the Earth, operated by a large international collaboration of scientists. The instrument enables observations with extremely high angular resolution. Using the EHT we obtained first resolved images of two black holes: M87* in the center of the M87 galaxy (2019), and Sagittarius A* (Sgr A*), in the center of our own galaxy (2021). I made fundamental contributions to the EHT project by designing, maintaining, and managing a large part of the data reduction pipeline. This work allowed me to understand the very fundamental aspects of radiointerferometry and to acquire technical capabilities necessary to design data pipelines for observational projects in astronomy. I also led the Time Domain Working Group within the EHT Collaboration (2018-2022), tasked with the time-domain analyses of the Sgr A* data. In recognition of my continuous contributions to the EHT science, I received the EHT Early Career Researcher Award four times, in every year since its establishment in 2020, as the only person within the EHT Collaboration. The first images of black holes that we presented are among the most important developments in astronomy in recent decades. They constitute the strongest evidence so far for the existence of supermassive black holes in the centers of galaxies.

I led successful research projects both on the fundamental theoretical aspects of gravity and black hole physics as well as on the observational characterization of astrophysical black holes. My particularly important individual contributions to science involve the discovery of polarimetric radio signatures of orbital motion near the event horizon of Sgr A* (Wielgus et al., A&A 2022) and characterization of the dynamics and variability of M87* (Wielgus+EHTC, ApJ 2020) – many of the predictions that I have made have been most recently confirmed through the first analyses of the EHT observations from 2018. For these two contributions global press releases were organized, with a lot of excitement from journalists and from the general public. Both results sparked a lot of interest and follow-up work from the scientific community. Both contributions are extremely relevant from the point of view of testing gravity and astrophysics with dynamics of gas very close to the black hole event horizon. My other significant research interests include the theoretical aspects of the problem of testing general relativity with the images of black holes (Wielgus et al., PRD 2020; Wielgus, PRD 2021).

I am experienced in procuring and managing research grants. In particular, I was a PI of a VENTURES grant from the Foundation for Polish Science in 2012-2014, PI of scientific computing grants on the Polish supercomputer PROMETHEUS (about 30 mln computing hours in total in 2018-2022), PI of the ALMA+EHT observations of Centaurus A in 2022.

**Resumen del Currículum Vitae:**

Employment
Since 2021: Research Scientist (postdoctoral) at Max Planck Institute for Radioastronomy, Bonn, Germany
2017-2021: Postdoctoral Fellow at Black Hole Initiative, Harvard University, Cambridge, USA
2017: Postdoctoral Researcher at Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, Warsaw, Poland
2011-2013: Engineer at Institute of Electron Technology, Warsaw, Poland

Education
2011-2016: PhD in Machine Design and Maintenance: Photonic Engineering; Institute of Micromechanics and Photonics, Faculty of Mechatronics, Warsaw University of Technology, Poland; specializing in adaptive singal processing for fringe pattern analysis (PhD thesis: Adaptive decomposition and analytic signal concept in the interferometric fringe pattern analysis)
2005-2010: Master degree in Automatic Control and Robotics: Photonic Engineering; Faculty of Mechatronics, Warsaw University of Technology, Poland; specializing in singal processing for fringe pattern analysis (MS thesis: Processing of fringe patterns obtained using the time-average interference method for vibration analysis)
2007-2010: Bachelor degree in Mathematics; Faculty of Mathematics, Informatics and Mechanics, University of Warsaw, Poland; specializing in partial differential equations and numerics (BS thesis: Perona-Malik equation and its numerical properties)

Longer professional visits
2023: Visiting Researcher, University of Valencia, Spain
2022: Visiting Researcher, Paris Observatory, France
2017: Visiting Researcher, KITP, University of California in Santa Barbara, USA
2015: Visiting Researcher, Center for Astrophysics | Harvard & Smithsonian, USA
2013: Visiting Researcher: National Institute of Industrial Technology, Buenos Aires, Argentina
2013: Visiting Researcher, Center for Astrophysics | Harvard & Smithsonian, USA
2013: Visiting Researcher, College of Charleston, USA

Research and bibliometry

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

I am interested in radioastronomy and in astrophysics of black holes and other compact objects. I have (co)authored over 100 research papers, that have been cited 12851 times, with h-index of 41, and 83 papers cited at least 10 times (Google Scholar). I have authored 28 publications as a first author, including 18 in peer-review journals, cited 636 times (Google Scholar).

Awards
- EHT Early Career Award (individual) 2020,2021,2022,2023
- Group Award (A) from the Royal Astronomical Society (with the EHT collaboration) 2021
- Albert Einstein medal (with EHT collaboration) 2020
- Bruno Rossi Prize for a contribution to High Energy Astrophysics (with EHT collaboration) 2020
- Breakthrough Prize in Fundamental Physics (with EHT collaboration) 2020
- Smithsonian Institute American Ingenuity Award (EHT collaboration) 2019
- Harvard BHI Prize for scientific contributions to the EHT project (individual) 2019
- National Science Foundation Diamond Achievement Award (EHT collaboration) 2019
- First prize in IXth Nationwide Competition "Young Innovators" for the best PhD Thesis 2017
- Polish Prime Minister Award for the best PhD thesis in Engineering 2017
- Foundation for Polish Science START award 2015-2016 (in 2015 with a distinction as 1 of 5 young scientists nationwide)
- First degree scientific performance team award from the President of the Warsaw University of Technology 2014
- Academic performance award from Polish Ministry of Science and Higher Education 2013

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PABLOS ALFONSO, DANIEL |
| **Referencia:** | RYC2023-044989-I |
| **Correo Electrónico:** | daniel.pablosalfonso@gmail.com |
| **Título:** | Jet Quenching and the Nature of the Quark-Gluon Plasma |

**Resumen de la Memoria:**

I am a researcher in high-energy nuclear physics specialized on the theoretical study of jets interacting with QCD matter under extreme conditions. My work has had a massive impact in the interpretation of the experimental data measured in the large accelerators dedicated to this field, the LHC and RHIC. My success in providing crisp explanations for the dynamics of jets within heavy-ion collisions has naturally elevated my work into essential contributions without which it would be impossible to understand the state-of-the-art in the field today.

I produced the first analytical predictions of the cone-size dependence of jet suppression, computed using state-of-the-art perturbative techniques. With a single parameter, this theoretical framework provides an excellent agreement of all available jet suppression experimental data across the board: collision system, centrality, transverse momentum and angular size, paving the way towards jet precision physics in heavy-ion collisions. My work has been instrumental in the identification of a ubiquitous selection bias effect that leads to an overrepresentation of those jets which experienced a narrower fragmentation in the high-virtuality stage of the evolution. I provided the first application of machine learning techniques to jets in heavy-ion collisions as a means to overcome these selection bias effects. I produced the first work to show the phenomenological consequences of the hydrodynamization of part of the jet energy, and how the wake manifests itself as a measurable excess of soft particles around the jet direction, accompanied by a depletion behind it. This is a central matter in the field of heavy-ion collisions as a whole, tightly related to the existence of a flowing medium. I provided the first computation of the impact of minijets on the extraction of one of the most important transport coefficients of the QGP, the specific shear viscosity. This work highlights the need to account for these new source of fluctuations, which are responsible for the partial destruction of collective flow. In the coming years I plan to extend the reach of my studies in a number of fronts. I have an ambitious program that addresses key questions not only in the field of heavy ion collisions, but also on smaller collision systems, given the ubiquity of collectivity effects.

Throughout my career, my work has uninterruptedly been represented as oral contributions at the most important international conferences in the field. I have already been invited twice as a plenary speaker at the major of all, with typically ~1000 participants from all over the world, the International Conference on Ultrarelativistic Heavy-Ion Collisions, also known as Quark Matter. I have developed my scientific activity in centers all over the world (MIT, McGill U., INFN), developing a wide network of collaborators from top institutions worldwide. I have been member of the JETSCAPE international collaboration, funded by the National Science Foundation of the USA, which brought together theoretical and experimental physicists, statisticians and software engineers from some of the best institutions in North America. Finally, I have contributed in mentoring early career researchers from several institutions.

**Resumen del Currículum Vitae:**

I participate in the world effort to understand the properties of QCD in extreme conditions. There are large accelerators dedicated to this field, such as the Relativistic Heavy Ion Collider (RHIC) at the Brookhaven National Laboratory (BNL) in the USA and the Large Hadron Collider (LHC) at CERN, in Europe. From a very early stage my theoretical predictions have had a direct impact in experimental analysis. My work has been cited by many papers from the major experimental collaborations at the LHC (CMS, ATLAS, ALICE) and RHIC (STAR, PHENIX), summing up to more than 35 publications, and a larger number of conference proceedings. My predictions have been directly compared to data in more than 15 of those papers. All my work has been done with international collaborators, including prestigious institutions such as MIT, CERN, INT, BNL, McGill U., reflecting my international profile and leadership.

My last contributions as an independent researcher have been characterized by their highly innovative nature. My articles are published in international Q1 journals, including 3 Phys.Rev.Lett. (one of them in solitary). According to Google Scholar database, I have been cited 1311 times, with more than 1000 citations in the last 5 years. I have given more than 40 talks at international conferences, specialized workshops and invited seminars in more than 12 countries, including top research centers such as MIT, CERN, BNL, Yale U., etc. In 2017 I was invited to give a plenary talk in Chicago at the most important conference in my field, the International Conference on Ultrarelativistic Heavy-Ion Collisions, with more than 1000 participants. In Sept. 2023 I was invited again to give a theoretical overview of the recent developments in jet physics.

I contributed to the birth of the Jet Energy-loss Tomography with a Statistically and Computationally Advanced Program Envelope (JETSCAPE) software package. I was a member of the international JETSCAPE collaboration between Sept. 2016 and Sept. 2020, funded by the National Science Foundation of the USA.

In 2021 I was awarded an international competitive grant (30 selected fellows) to develop my own project with full independence, as a Principal Investigator. I became a Marie Curie FELLINI Fellow at the Turin unit of the INFN, funded by MSCA-COFUND. I was funded to develop the ideas outlined in my project "JetQGP - Jet Quenching and the Nature of the Quark-Gluon Plasma".

From the start of my career I have been involved in mentoring activities of international students that have resulted in impactful publications. I supervised de facto the Undergraduate Research and Opportunities Program of MIT student Zachary Hulcher. Work done with McGill U. PhD student Mayank Singh was included in his PhD thesis. Undergraduate student Philipp Dorau did his Bachelor thesis at the Johann Wolfgang Goethe-Universität Frankfurt am Main on a project I devised.

I am a convener for the Heavy-Ion track of the most important conference for the LHC physics, LHCP, to be held in Boston in June 2024.

In June 2022 I was invited to chair a discussion session of the specialized international workshop "Jet Quenching in the Quark-Gluon Plasma", in Trento, Italy.

In Sept. 2021 I participated in the outreach activity "European Researchers' Night" 2021 edition at the Castello del Valentino in Turin, Italy.

**Área Temática:** Ciencias físicas
**Nombre:** MASTROBUONO BATTISTI, ALESSANDRA
**Referencia:** RYC2023-044329-I
**Correo Electrónico:** alessandra.mastrobuono-battisti@obspm.fr
**Título:** THE ORIGIN AND FATE OF SELF-GRAVITATING SYSTEMS IN THE UNIVERSE

**Resumen de la Memoria:**

I am a Computational and Theoretical Astrophysicist who is leading international collaborations aiming at understanding the origin and evolution of globular clusters and of their stellar populations, as well as the dynamical and high-energy processes ongoing in dense nuclear star clusters. In my studies, I use GPU-accelerated direct N-body codes – including my open source GPU code "NBSymple". Furthermore, I have been recently habilitated as a Full and Associate professor in Italy. I am a member of ESA Gaia DPAC-CU6, in which I am the globular cluster expert. I am part of the "Nancy Grace Roman Space Telescope" core community, the "Lunar Gravitational Wave Antenna" project, and the ELT-MOSAIC Science Team. I actively collaborate with groups in France, Germany, Italy, US, Israel, Sweden.

My extensive numerical and theoretical work on galactic nuclei clarified the origin of nuclear clusters in galaxies, focusing on the Milky Way. With my models, I successfully reproduced the structural and dynamical details of the Galactic nucleus through the accretion of globular clusters at the galactic centre and used pulsars to probe its formation history. I investigated stellar collisions near supermassive black holes (SMBHs), shedding light on the debated origin of the G2 cloud. I introduced innovative indirect methods to detect SMBH binaries through their effect on the large-scale structure of galactic nuclei. My work marks a significant milestone in identifying intermediate-mass black holes in globular and nuclear clusters through their high-energy effects.

I am a recognized expert in the study of globular cluster dynamics and evolution. My models impacted the interpretation of data from pioneering instruments (Gaia, HST, VLT), uncovering the origin and fate of many Galactic globular clusters (e.g. M54, in collaboration with Max Planck scientists). I have revealed how the multiple population phenomenon impacts the current structural and dynamical properties of globular clusters, providing tools (which have been used by observers in my collaborations) to unveil how this puzzling phenomenon arose at high redshift by looking at today's clusters. I used NBSymple to study how massive clusters can form second-generation stars and lose enough mass to reach their current state, challenging previous assumptions. I was the first to successfully replicate and predict the substructures observed in globular cluster tidal streams and use them to constrain the granularity of the dark matter halo.

On planetary scales, I solved the long-standing Earth-Moon composition similarity issue (Mastrobuono-Battisti et al. 2015, Nature). This work, which is the result of a collaboration I led in France and Israel, has been followed by multiple (50+) press releases and a further lead author paper.

Future plans:
My project aims to understand Milky Way (MW) formation using numerical models and data from JWST, HST, Gaia, and gravitational-wave observations. It focuses on MW assembly through satellite and globular cluster accretions and develops innovative numerical approaches to model binary and compact object mergers in nuclear and globular clusters, predicting gravitational wave events. The project bridges traditional and gravitational wave observations, impacting our understanding of galactic formation processes.

**Resumen del Currículum Vitae:**

Currently, I am a research fellow at GEPI, Observatoire de Paris, where between 2021 and 2023 I led a team of four early-career researchers: 2 co-supervised PhD students (S. Ferrone and G. Pagnini and, previouly, Dr E. Lacchin, now in Padova) and 2 MSc students under my sole supervision (M. Maglione and L. Delit). This has been funded by the Horizon2020 Marie Curie Individual Fellowship and can be documented if required. Previously, I held the following positions: (1) researcher at the Observatory of Lund (Sweden) for two years, (2) a totally independent research fellow (Prize Fellowship) at the Max Planck Institute for Astronomy (Heidelberg, Germany) for four and a half years, (3) a Lady Davis research fellow at the Technion (Haifa) for three years and (4) La Sapienza, where I completed my PhD in 2012, under the supervision of Prof. Capuzzo Dolcetta. Additionally, I have spent long-term (i.e. longer than at least one month) scientific visits to different institutions (Harvard, and Rochester Institute of Technology in the US, Nottingham University in the UK, GEPI in Europe to mention a few). Three of my first author papers and the long-standing collaboration with H. Perets (now Technion, Haifa, Israel) and P. Di Matteo (GEPI) as well as my current position at GEPI stemmed from these short-term visits.

Fellowships: As a PI, I have secured funding for more than half a million EUR, in Europe and Israel (including my MSCA fellowship). I have been the PI for 5 computing proposals (in Sweden, Italy, Cyprus, France; >500k GPU hours) and Co-I of observing proposals (HST, CHFT, GEMINI).
I have received recognition for my contributions, including the "Immagine", "Lievito 2016" and "Latina va in Scena" prizes, and a "Formal recognition", all acknowledging my outstanding scientific achievements.

Teaching and Supervision Expertise: I supervised 7 PhD students (9 papers, including E. Lacchin and F. Aros now postdocs in Padova and the US and F. Abbate now researcher at INAF), 2 MSc students, and 1 BSc student (1 paper). I have taught courses in numerical methods in Astrophysics (Italy), stellar structure and evolution, high-energy astrophysics (Sweden), and provided two training-through-research MSc courses on stellar dynamics (France).

Contributions to the wider research and other responsibilities: I have been the main organiser and PI of the funding proposal for one conference (85 participants, 11000 EUR, 2018, Heidelberg). I have been a SOC member for 7 meetings and a reviewer for HST proposals. I am a referee for Q1 IOP Journals, MNRAS and A&A. Since 2021, I have been organising the Paris GalCosmo Seminars. In 2021, I served as a panel member for the evaluation of MSc and BSc Theses in Lund. I have been part of PhD students and postdocs hiring committees at MPIA and GEPI.

Productivity and Outreach: I have 6300+ citations (h-index: 28, ADS data, 70 refereed publications, 11 as the 1st author, 20 as the 2nd or 3rd author). Between 2019 and as of writing this CV, I have accumulated 5600 citations.

I have given 10 invited talks, 30 contributed conference talks and 20 invited seminars at international institutes (such as Harvard, Nottingham, Max Planck etc).

I have delivered 13 public outreach lectures in Italy, Sweden, and Israel, including a TEDX talk. I have contributed to 50+ press interviews and to books on outstanding women in science.

**Resumen de la Memoria:**

See research proposal for detailed descriptions on all that follows.

Main achievements/international mobility. Three groundbreaking works: 1-' Microscopic origin of black hole entropy in general relativity' (published in PRX, wrote in USA), 2- ' Quantum chaos and the complexity of spread of states' (Editor' s suggestions, wrote in USA), 3-' Entropic order parameters for the phases of Quantum Field Theory' (wrote it with Horacio Casini and Marina Huerta, New Horizon in physics prize 2015, founding fathers of the application of Quantum Information Theory (QIT) to Quantum Field Theory (QFT)). Two significant works: 4-' Quantum Computation as Gravity' (over two hundred citations), 5-' Random free fermions: an analytical example of eigenstate thermalization' (solo work published in PRL). 6- Significant organized long-term workshop: ' The microscopic origin of black hole entropy' , Aspen Center for Physics (USA, June 2024). 7-Invited seminars in top scientific venues (e.g. Stanford, KITP Santa Barbara, IAS Princeton, MIT, Perimeter Institute). 8-Participation in prestigious international collaborations, the ' It from Qubit' (funded by the Simons Foundation) and QuantISED (founded by USA). 9-International mobility: I worked and collaborated with researchers on four continents and ten countries. I was postdoc in: University of Pennsylvania, Instituto Balseiro, The Netherlands, Natal (Brazil). Achievement of professor status in an internationally recognized institute: ' Grupo de partículas y campos' of the Centro Atómico de Bariloche, Instituto Balseiro, Argentina.

Regarding independence and leadership I have several solo works and opened internationally recognized research lines. In the postdoctoral positions I always carried a research line by myself and another line with the local researchers, demonstrating independence. Also, the research line with the local group was always new to them, demonstrating leadership. At present I am leader in three different research lines. I have organized significant conferences/workshops, and been invited to many. I am mentor of two students who just finished ' trabajo de fin de grado' (maximal degree), now working towards the master's thesis (will finish this year). I led the thesis of three Ph.D. students (see Inspire profile for the articles), one PhD student of Vijay Balasubramanianan, two of Horacio Casini. It is an honor and proof of internationalization that professors across the world sign recommendation letters for me (and would support this application) including: Horacio Casini (Instituto Balseiro, New Horizon in Physics prize 2015), Vijay Balasubramanian (University of Pennsylvania), Edward Witten (Institute for Advanced Studies, Princeton, Fields medalist), Stefan Vandoren (Director Theoretical Physics Institute, Utrecht University), Roberto Emparan (Universidad de Barcelona), Jose Barbon (Director Instituto de Fisica Teorica, Madrid), Joan Simon (Edinburgh University).

I pursue three original research lines at the moment. 1- ' Black Holes in Quantum Gravity' , originating in my explanation of the origin of the Bekenstein-Hawking entropy. 2- ' QIT and Generalized Symmetries in QFT and Quantum Gravity' , originating in my work that explains how QIT captures symmetries in QFT. 3- ' Quantum chaos and quantum complexity' , originating in my work that proposes a new measure of complexity capturing quantum chaos.

**Resumen del Currículum Vitae:**

Main achievements: three groundbreaking works (see research proposal), opening three research lines. First work: ' Microscopic origin of black hole entropy in general relativity' , published in Physical Review X. I explain origin of the Bekenstein/Hawking formula for black hole entropy (outstanding problem in science). It prompted the organization of a workshop in the Aspen Center for Physics titled ' The microscopic origin of black hole entropy' (June 2024). I organize this workshop, together with V. Balasubramanian, J. Turiaci, H. Verlinde (professors at Pennsylvania, Washington, and Princeton).

Second work: ' Quantum chaos and the complexity of spread of states' , published in Physical Review D under ' Editor' s suggestion' (90 citations in two years, famous paper trend). It tackles problems in Quantum Information Theory (QIT) and Quantum Gravity (QG). Co-author (P. Caputa) earned an ERC-consolidator grant based on this. Co-author (V. Balasubramanian) was invited to the annual Strings conference. I was invited to e.g. Stanford, British Columbia, Banff (Canada), lecture at school QIT/QG (India, August 2024).

Third work: ' Entropic order parameters for the phases of Quantum Field Theory' . QIT, and symmetries are fundamental in Quantum Field Theory (QFT). My work describes how QIT captures symmetries in QFT, re-discovering the notion of ' generalized symmetry' . It provides an entropic order parameter for confinement. Written in collaboration with Profs. Horacio Casini and Marina Huerta, recipients of New Horizons in Physics Prize 2015. I was invited to present this (and follow-ups) at IAS in Princeton (twice), MIT (twice), Santa Barbara, Stanford, and EuroStrings 2023.

Main contribution to society: from 10/2016 to 1/2023, I was member of the ' It from Qubit: Simons Collaboration on Quantum Fields, Gravity and Information' (funded by the Simons Foundation). This collaboration is one of the most prestigious in QIT and QG, with strong impact on the scientific society. Results were described for general public in e.g. nature, scientific American, interviews. The collaboration shares relations with Google through quantum computing and artificial intelligence. I led the organization of the It From Qubit school and workshop.

Internationalization: PhD in Spain; Postdoctoral Fellow in University of Pennsylvania; Centro Atomico de Bariloche; Amsterdam/Utrecht/Leiden; Natal, Brazil. Visits to YITP Japan; Amsterdam University; Stanford; IAS; City University (New York); Racah Institute

(Jerusalem); Edinburgh; etc. Invited talks to most top venues of the world. Professors from all over the world sign recommendation letters for me, see research proposal.

Student training/lecturing/refereeing: two students of mine finished the 'trabajo de fin de grado', working towards master thesis. I led the thesis of two Ph.D. students of Prof. Horacio Casini and one of Vijay Balasubramanian (see publications with D. Pontello, V. Benedetti, and Q. Wu). I can teach any course on theoretical physics. I can contribute with advanced (master/PhD) courses: Quantum complexity and quantum chaos; Black hole entropy; QIT in QFT; Generalized symmetries in QFT.

I have been recruited as a permanent professor at the 'Grupo de partículas y campos' of the Centro Atómico de Bariloche, Argentina, one of the most prestigious groups in theoretical physics.

**Resumen de la Memoria:**

My interdisciplinary research encompasses quantum optics, topological/nonreciprocal optomechanics, and nonlinear physics. Trained as a theoretical physicist in condensed matter and quantum optics, my work focuses on computational methods for many-body problems and perturbative approaches.

During my PhD at the Autonomous University of Madrid, under Prof. Francisco José García Vidal and Dr. Johannes Feist, I specialized in cavity quantum electrodynamics, studying the coupling of electronic or nuclear states in organic molecules with confined radiation, forming hybrid states known as polaritons. My initial research aimed to model Prof. Thomas Ebbesen's experiments on polaritons enhancing energy transport and chemical reactions, leading to the field of "polaritonic chemistry".

1. My first significant contribution, "Quantum theory of collective strong coupling of molecular vibrations with a microcavity mode" (New Journal of Physics 17 053040, 2015), analyzed the dynamics of "vibro-polaritons" and the role of non-radiative "dark states". This paper has over 200 citations and paved the way for further research.

2. I then explored the Raman spectroscopic signals of vibro-polaritons in "Signatures of Vibrational Strong Coupling in Raman Scattering" (J. Phys. Chem. C, 2015, 119 (52)). This work proposed applications like Raman lasers and has nearly 100 citations.

3. Collaborating with Dr. Alex Chin's group at Cambridge University, we used tensor network simulations for non-perturbative open quantum systems in "Tensor Network simulation of non-Markovian dynamics in organic polaritons" (Phys. Rev. Lett. 121, 227401, 2018). This introduced a new technique in molecular polariton dynamics, cited nearly 120 times.

4. We also used the Density Matrix Renormalization Group method in "Tensor Network simulation of polaron-polaritons in organic microcavities" (Phys. Rev. B 98, 165416, 2018), revealing "polaron decoupling" in complex vibronic spectra.

After my PhD, I joined Prof. Ewold Verhagen's optomechanics experimental group at AMOLF, Amsterdam. My work here expanded to engineering non-reciprocal and topological transport of light and sound at the nanoscale.

5. In "Synthetic gauge fields for phonon transport in a nano-optomechanical system" (Nature Nanotechnology volume 15, 2020), we demonstrated the nanomechanical Aharonov-Bohm effect, gaining significant recognition including a Nature Nanotechnology cover feature.

6. "Non-Hermitian chiral phononics through optomechanically-induced squeezing" (Nature 606, 2022) introduced non-reciprocal energy transport in bosonic systems, leading to the discovery of the "non-Hermitian" Aharonov-Bohm effect.

7. Collaborating with Prof. Andreas Nunnenkamp, we explored "Quadrature non-reciprocity" (Nature Physics 1-8), showcasing a new class of bosonic systems exhibiting non-reciprocal transport.

8. My recent work, "Dynamical gauge fields with bosonic codes" (Phys. Rev. Lett. 130, 171901, 2023), outlines essential components for a quantum simulator of dynamical gauge fields in nonlinear bosonic systems.

Additionally, I have contributed to the development of open-source software (see github.com/NonlinearOscillations/HarmonicBalance.jl) and organized an international workshop on Parametric Phenomena (pep.ethz.ch),  reflecting my commitment to scientific community building, collaboration and knowledge dissemination.

**Resumen del Currículum Vitae:**

Soy un físico teórico especializado en materia condensada e óptica cuántica, con enfoque en física de muchos cuerpos, física no lineal y física topológica, aplicada a tecnologías cuánticas y metamateriales. Me gradué en Física en la Universidad Autónoma de Madrid (UAM) en 2012 y realicé mi tesis de máster en el Instituto de Física Fundamental (IFF-CSIC), supervisada por el Dr. Juan José García-Ripoll y el Prof. Francisco José García Vidal, con resultados publicados en Phys. Rev. Lett. 112 (21), 216805.

Durante mi predoctorado en la UAM, bajo la supervisión del Prof. García Vidal y el Dr. Johannes Feist, me centré en electrodinámica cuántica en moléculas orgánicas, estudiando el fuerte acoplamiento luz-materia y su impacto en la decoherencia vibracional y "estados oscuros" no radiativos, con implicaciones en láseres Raman y otros campos (Aportaciones 9 y 10 en C1 y Phys. Rev. Lett.117 (27), 277401).

En colaboración con el Dr. Alex Chin en la Universidad de Cambridge, utilicé técnicas avanzadas de redes tensoriales para describir acoplamientos en excitones-polaritones, abriendo el campo de la "química polaritónica" y afectando la espectroscopía ultrarrápida (aportaciones 7 y 8 en C1 y aportación 5 en C1).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Tras mi doctorado (2018, Cum Laude y Premio Extraordinario), me uní al grupo del Prof. Ewold Verhagen (AMOLF), donde desarrollé modelos teóricos para experimentos optomecánicos, prediciendo fenómenos como la interferencia de Aharonov-Bohm fonónica y abriendo vías en no-reciprocidad en señales (aportaciones 4 y 6 en C1 y arXiv:2309.05825, aceptado en Nature).

Como ETH Fellow en ETH Zürich desde 2021, he investigado efectos no-lineales y paramétricos en sistemas bosónicos. Desarrollé el método de "equilibrio armónico" y la librería HarmonicBalance.jl, aplicada en proyectos doctorales y cooperación con matemáticos (aportación 3 en C1, repositorio en GitHub y arXiv:2308.06092).

Desde enero de 2023, soy co-supervisor de un estudiante doctoral en el grupo del Prof. Christian Degen en ETH, con foco en nanomecánica y Resonancia Magnética Nuclear (arXiv:2311.16273). He organizado un Workshop internacional en Fenómenos Paramétricos con el Dr. Alex Eichler (ETH).

Desde octubre de 2023, soy Profesor Interino en la Universidad de Konstanz, impartiendo cursos en métodos teóricos y extendiendo mis investigaciones a simulación cuántica en teorías de altas energías y corrección de errores cuánticos (Aportación 2 en C1).

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|---|---|
| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PARRA  RIVAS, PEDRO |
| **Referencia:** | RYC2023-043590-I |
| **Correo Electrónico:** | parrariv@gmail.com |
| **Título:** | Spatiotemporal nonlinear dynamics of multidimensional dissipative structures |

**Resumen de la Memoria:**

During my scientific career, my work has focused on the study of nonlinear spatiotemporal phenomena emerging in extended systems driven out of thermodynamic equilibrium, also known as dissipative systems. Emergence is related to the appearance of behavior that cannot be anticipated from one of the constituents of the system alone, and is related with what is known as self-organization: the spontaneous appearance of anisotropic structure due to the interaction of the components of the system and without any external entity engineering the process.

One of the most interesting phenomena arising in these systems is the spontaneous formation of well-ordered extended structures, the so-called patterns. Extended patterns are omnipresent in nature, and appear in a vast variety of contexts. One typical example is the stripe patterns observed in sand dunes and in the coat of a zebra. Despite the different natural contexts, the morphology of these patterns are similar, and their origin can be explained using the same theory. This feature is known as universality.

I am particularly interested in what is called "spatial localization", i.e., the formation of coherent localized patterns, also known as localized structures (LSs). Similarly to extended patterns, LSs appear in many different natural scenarios ranging from granular media, to dryland ecosystems and nonlinear optical devices. During the past 11 years, I have investigated the formation and dynamics of LSs in different systems, particularly in dispersive nonlinear optical cavities. In these devices, LSs consist of one-dimensional (1D) solitonic pulses of light that propagate indefinitely, and have been proposed for different applications such as information processing and frequency comb generation. Applying bifurcation and dynamical system theory, I have been able to unveil the complex bifurcation structure (BS) and stability of these states, which are essential to understand and characterize their dynamics. Due to their universality, my results are applicable to other scientific contexts, and during the last 5 years I have diversified my research, expanding my studies to different types of reaction-diffusion systems, ranging from vegetation population in dryland ecosystems to molecular biology. The BS of 1D LSs is nowadays quite well understood, in part due to my own research. However, in 2D and 3D, the complexity of the systems increases considerably, and the BS and dynamics of LSs is far to be well understood.

My research line for the coming years focuses on the characterization of the BSs, stability, and dynamics of high-dimensional dissipative LSs. To do so, I will first investigate this phenomenon in the prototypical models describing pattern formation in dissipative systems. The results obtained here will be key to extending my research to other systems including externally driven dispersive-diffractive Kerr cavities, reaction-diffusion systems in molecular biology, neural activity and pattern formation in dryland ecosystems. The outcome of this research may be essential to understand and predict different observed natural phenomena including the formation of spatiotemporal light bullets, different neural processes (e.g., memory), the spread of cancer, and desertification processes in ecology, to only cite a few.

**Resumen del Currículum Vitae:**

In 2010, I obtained my Physics degree (Universidad de Granada) and one year later my Master in Mathematics (Universidad de Salamanca). These studies provided me with a strong background in theoretical physics and advanced mathematics which have been key for my research career.

In 2011, I joined the Institute for interdisciplinary research and complex systems (IFISC) in Palma de Mallorca (Spain) where I started my scientific research in nonlinear phenomena, particularly in systems driven out of thermodynamic equilibrium. During this period, I published my first article (as first author) in Physical Review Letters [Phys. Rev. Lett. 110, 064103 (2013)]. This publication allowed me to obtain, in 2013, my own Research Foundation Flanders (FWO) PhD fellowship (Belgium), and in October the same year, I started a joint PhD between the Universitat de les Illes Balears (UIB, Spain) and the Vrije Universiteit Brussel (VUB, Belgium). My research at that time focused on the study of nonlinear spatiotemporal phenomena arising in passive Kerr optical cavities. In March 2017, I obtained my European PhD diploma in Physics from the UIB and my PhD diploma in Sciences from the VUB, both with honors. By the end of my PhD studies, I was the first author of 10 peer-review articles [e.g., Op. Lett. 41, 2402 (2016); Phys. Rev. E 97, 042204 (2018)]. During that period, I spent two months working with E. Knobloch at the University of California, Berkeley (US). This research stay was essential for my scientific success as I learnt advanced bifurcation and applied dynamical systems theory that I have been using ever since.

After finishing my PhD, I was awarded a one-year postdoctoral grant at KU Leuven (Belgium). Here, I started to investigate emergent nonlinear spatiotemporal dynamics in different reaction-diffusion systems including plant ecosystems and the cell-division cycle. In 2018, I joined the Opera-Photonics research group at the Université libre de Bruxelles (ULB), with my own FNRS postdoctoral fellowship (three years). The main goal of my research project was the theoretical characterization of temporal localization in quadratic optical cavities. My work led prolific production [e.g., Op. Lett. 44, 2004 (2019); Phys. Rev. Res. 4, 013044 (2022)], including two Nature Photonics publications [Nat. Phot. 15, 536 (2021), Nat. Phot. 15, 857 (2021)].

In 2021, I was awarded with an individual Marie Curie fellowship (two years) to study the formation and stability of 3D spatiotemporal optical solitons, and in November the same year I joined the research group of S. Wabnitz at la Sapienza (Italy). This research period yielded a prolific scientific production (> 20 peer-review publications) including a PRL [Phys. Rev. Lett. 131, 137201]. In my current position (AddSapiExcellence Sapienza fellow), I continue studying these states but in a dissipative context.

Currently, I have an h-index of 17 and >1140 citations, 50 publications in peer-reviewed journals (26 as first, 2 as co-first, 5 as leading, and 1 as single author; 30 without PhD supervisors), and a collaboration network of > 50 researchers distributed worldwide. My work is strongly disseminated at international conferences (>30 peer-reviewed proceedings, >20 oral contributions, 7 invited). Moreover, I have trained 3 postdoctoral researchers, 2 PhD students, and I have taught different Bachelor and Master courses.

**Área Temática:** Ciencias físicas
**Nombre:** ARNAS MARTÍNEZ, DAVID
**Referencia:** RYC2023-042913-I
**Correo Electrónico:** davarnas@gmail.com
**Título:** Mecánica orbital en la era de las megaconstelaciones

**Resumen de la Memoria:**

El número de satélites en órbita alrededor de la Tierra ha crecido exponencialmente en los últimos años. De los alrededor de mil satélites activos existentes hace diez años, a los más de nueve mil satélites activos al finalizar el año 2023, con planes ya aprobados para lanzar cien mil nuevos satélites en los próximos diez años. La mayoría de estas misiones se desarrollan en la región de espacio más cercana a la Tierra conocida como Low Earth Orbit lo que ya ha provocado un crecimiento significativo de la densidad de objetos en esta región y provocando que centros de control alrededor del planeta hayan tenido que aumentar el número de maniobras que los satélites tienen que realizar para evitar una colisión en órbita. Este hecho, no sólo empeora la seguridad de estos satélites, sino que también reduce la vida útil de las misiones y su complejidad.

Actualmente existe muy poca normativa internacional acerca de dónde se pueden situar nuevos satélites. Esto provoca que el primer actor que posiciona un satélite en una determinada región del espacio está, a efectos prácticos, adquiriendo esa región y evitando que otros actores puedan acceder a ella. Es por ello que diferentes agencias como NASA o ESA han empezado a preocuparse por este acuciante problema para asegurar la futura sostenibilidad del sector espacial. Desafortunadamente, dado el tamaño del problema y sus dificultades técnicas, la aprobación de nuevas misiones sigue llevándose a cabo en función de valoraciones económicas y políticas, no habiendo un criterio científico claro que permita tener una valoración técnica y precisa sobre el impacto futuro de estas misiones.

Para solventar este problema, propongo el uso de teoría analítica de diseño de constelaciones para definir y estudiar un mecanismo imparcial que determine las posibles regiones del espacio que futuras misiones pueden ocupar sin afectar la seguridad y futura sostenibilidad del sistema. Con ese objetivo en mente, planeo combinar astrodinámica y las características geométricas inherentes a constelaciones, con propiedades provenientes de teoría de números y teoría de grupos. Esto permite reducir el espacio de configuración del problema y analizar sistemas con miles de satélites usando el mismo formalismo y propiedades observadas en constelaciones con un número mucho menor de objetos. A su vez, estos métodos, al estar basados en teoría analítica, proporcionan un mayor entendimiento del sistema en su conjunto, y de cómo cada parámetro afecta a su funcionamiento.

El objetivo final de esta investigación es la de definir una serie de estructuras de estacionamiento móvil para satélites que: aseguren la ausencia de encuentros próximos entre satélites pertenecientes a la estructura, optimicen la capacidad y seguridad del sistema, y proporcionen un mecanismo claro y justo por el que nuevas misiones puedan acceder al espacio. Esto proporcionará a legisladores y compañías privadas las herramientas necesarias para decidir, con información cuantitativa, cuál es la dirección a seguir para definir el futuro del sector espacial. Adicionalmente, estas estructuras permitirán un seguimiento de satélites más eficiente, el lanzamiento de nuevas misiones que actualmente serian inviables, y la posibilidad de adaptar el sistema a situaciones imprevistas o cambios en tecnología y política espacial.

**Resumen del Currículum Vitae:**

David Arnas ha centrado su investigación en la definición y estudio de constelaciones de satélites. Esto incluye el desarrollo de métodos analíticos que combinan teoría de números y teoría de grupos con mecánica orbital y las propiedades geométricas intrínsecas de constelaciones, lo que ha convertido a David Arnas en uno de los pocos investigadores en el mundo que actualmente trabaja en este tema desde un punto de vista analítico. Su investigación ha permitido la definición, análisis y optimización de constelaciones utilizando una representación matemática mínima y común, esto es, una formulación capaz de ser usada para constelaciones de cualquier tamaño y que proporciona una herramienta para extrapolar propiedades de constelaciones pequeñas a otras mucho más grandes. Un ejemplo de aplicación de esta investigación ha sido la optimización de constelaciones de más de 10000 satélites, un proceso que es computacionalmente inviable utilizando métodos puramente numéricos dada la alta dimensionalidad del problema. Otro ejemplo de la utilidad de esta investigación ha sido la determinación por métodos puramente analíticos del tiempo de revisita de constelaciones, un problema anteriormente considerado como altamente costoso desde el punto de vista computacional.

Además de esta investigación, David Arnas ha investigado en otros campos incluyendo, entre otros, teoría de perturbación y ciencias de la computación. Más concretamente, su investigación le ha llevado al estudio de la dinámica orbital entorno a la Tierra, estudiando los efectos que las perturbaciones orbitales tienen en la trayectoria de satélites. Esto le ha llevado a ser el primer investigador en aplicar teoría analítica de operadores, generar una solución analítica de tercer orden en elementos osculadores, y obtener en forma cerrada las condiciones para definir orbital congeladas en elementos osculadoes para el problema zonal de gravitación terrestre. Adicionalmente, David Arnas ha trabajado en métodos analíticos para analizar formaciones de satélites lo que ha llevado al diseño de órbita y control de la misión FLEX de la Agencia Espacial Europea. Finalmente, David Arnas también ha trabajado en ciencias de la computación y la generación de algoritmos para diferentes aplicaciones, incluyendo sensores de estrellas (con lo que gano el primer premio en la competición internacional "Star-trackers First Contact" organizada por la ESA), búsqueda en bases de datos, y solución de ecuaciones diferenciales. En total, David Arnas ha publicado 27 artículos en revistas del JCR, siendo el primer autor en 23 de ellos.

Respecto a docencia, David Arnas trabajó durante dos años como profesor ayudante doctor en diferentes instituciones en España antes de convertirse en assistant professor en Purdue University donde lleva trabajando dos años y medio adicionales. Esto ha incluido trabajar como profesor en departamentos de física, matemáticas, educación, e ingeniería espacial enseñado cursos en diferentes ramas de la ciencia. Adicionalmente, David Arnas es director del grupo de investigación Astrodynamics Research Team en Purdue University y profesor responsable del grupo de investigación

estudiantil SLING, lo que le permite mentorizar a un número significativo de alumnos incluyendo ser director de tesis de 2 alumnos de máster y 3 de doctorado, y mentor de otros 10 alumnos de máster y 10 de grado.

**Área Temática:** Ciencias físicas
**Nombre:** CORNEJO GARCIA, JUAN MANUEL
**Referencia:** RYC2023-042535-I
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**Título:** Quantum technologies for high-precision Penning trap experiments

**Resumen de la Memoria:**

My research focuses on quantum optics and quantum metrology by using ion traps. I have an extensive experience on coherent manipulation of atomic ions using lasers in high magnetic fields with applications for experimental tests of fundamental symmetries, such as CPT invariance. Additionally, I have a strong background in mass spectrometry by using Penning-magnetic traps for applications in particle and nuclear physics. My line of research focuses on developing quantum technologies for high-precision experimental tests in physics by means of Penning traps. This device is an excellent tool for high-precision experiments in physics, with applications ranging from nuclear and particles physics to test of fundamental symmetries. The BASE experiment at CERN is an example of such an experiment, where ultra-high precision measurements of the g-factor of protons and antiprotons, as well as the charge-to-mass ratio of protons and antiprotons are performed. These low energy, extremely high-accuracy tests can shed light on the observed matter-antimatter imbalance in the universe and to include gravity for a unified description of matter and interactions, beyond the current standard model of particle physics. In this proposal, quantum technologies developed for radiofrequency traps in the context of ion quantum processing will be developed and applied to its use with single particles in Penning traps. Specifically, ion transport methods developed in the context of ion quantum processing for applications on high-precision experiments with protons and antiprotons. This will have direct implications on discrete symmetry CPT comparison tests in the baryonic sector of the standard model extension within the BASE collaboration, and also further implications for high-precision experiments in multi-Penning-traps for mass measurements or measurement of fundamental constants, as well as a key requirement for the use of quantum logic spectroscopy in Penning traps. To achieve this goal, I have outlined a comprehensive five-year plan in this proposal. Summarizing, voltage waveforms generated by SINARA hardware and controlled by ARTIQ software will be produced to shuttle adiabatically single trapped ions in short time scales. In addition, electronics components with the required characteristics for its use in ultra-low noise environment will be developed. Following this initial period, transport waveform will undergo testing in an ion trap as a collaboration with the Trapped-Ion Quantum Engineering group at the U. Hannover or at the ion traps research group at the U. Granada. Optimization by filter predistortion or by shortcut to adiabaticity method can also be studied. Afterwards, these transport routines will be implemented at the BASE experiment of CERN. Finally, other funding opportunities would be sought in order to pursue alternatives lines of research in collaboration with the Ion Traps Research group at the U. Granada.

**Resumen del Currículum Vitae:**

In 2010, I graduated (licensed) from the U. Granada with a five-year degree equivalent to a Bachelor's and a Master's degree in Physics. Afterwards, I earned a master's degree in Nuclear Physics from the U. Granada, U. Barcelona, U. Complutense Madrid, U. Salamanca, U. Sevilla and U. Autonoma Madrid in 2011. During my master's thesis, I developed an electromagnet system to produce monoenergetic electron beams up to several MeV for medical physics applications in the Department of Atomic, Molecular, and Nuclear Physics at the U. Granada thanks to a two-year pre-doctoral position from the Centro Nacional de Física de Partículas, Astropartículas y Nuclear (CPAN). In 2012, I started my PhD at the U. Granada in the TRAPSENSOR project, which was funded by the European Research Council and supervised by Prof. Dr. Daniel Rodríguez. My dissertation, titled 'The Preparation Penning Trap and Recent Developments on High-Performance Detection for the Project TRAPSENSOR,' was completed in February 2016. After completing my PhD, I relocated to the Leibniz Universität Hannover in Germany to join the trapped-ion quantum engineering group at the Institut für Quantenoptik, led by Prof. Dr. Christian Ospelkaus. During this period, I guided the efforts to implement quantum logic-inspired techniques for g-factor measurements of protons and antiprotons within the BASE (Baryon Antibaryon Symmetry Experiment) collaboration. In 2021, I assumed the role of responsible scientist for the proton experiment in Christian Ospelkaus' group, and from October 2023, I become principal investigator for the quantum metrology with trapped (anti-) protons project within the collaborative research center DQ-mat (SFB 1227). Currently, I am deputy team leader for BASE experiment at U. Hannover and I am also working as corresponding PI for an ERC synergy grant proposal within the BASE collaboration to be submitted in 2024. During my predoctoral research, I built and commissioned Spain's first ion trap laboratory. I also conducted the first experiments on Penning traps in Spain, with prospects for the MATS (Precision Measurements of very short-lived nuclei using an Advanced Trapping System) experiment at the FAIR (Facility for Antiproton and Ion Research) facility in Darmstadt, Germany. During this period, 10 publications were realized (7 during my phd as first author and 3 afterwards). Additionally, I mentored several Master's students to complete their theses (3 Master's theses) as well as several predoctoral researchers during their time on the project (6 predoctoral researchers). During my postdoctoral research, I led the efforts to build and commission the proton-antiproton experiment in Christian Ospelkaus' group at U. Hannover. As part of this research group, with an extensive experience on full motional control at the single quantum level of trapped ions in radio-frequency surface-electrode traps and currently developing a 50-ions qubit quantum computing demonstrator based on trapped ions, I aim to implement the quantum toolbox developed for radio-frequency traps in Penning-magnetic traps. During this period, 10 publications have been produced (4 as first author) and I also mentored several phD students (3 completed and 2 in progress), as well as several Master's and Bachelor's students to complete their theses (2 Master's theses and 1 Bachelor's theses).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Ciencias físicas
**Nombre:** ARAÚJO , MATEUS
**Referencia:** RYC2023-044074-I
**Correo Electrónico:** mateus.araujo@uva.es
**Título:** Quantum information and optimization theory

**Resumen de la Memoria:**

Throughout my career I have researched quantum information, both on the foundational side and on the applied side. My research has been motivated by the twin questions: what lies beyond classical mechanics, and what lies beyond quantum mechanics.

In the beginning of my career I was focused on the first question, researching Bell inequalities and noncontextuality inequalities. I've refined the mathematical tools to treat them, found new inequalities, and designed better experiments to test them. This work was very influential, as my techniques became standard in the field of contextuality. With this work I first became acquainted with optimization theory, in the form of semidefinite programming, which would remain a useful tool and a research interest.

Afterwards, my focus changed to the second question, and in particular what could happen if we relaxed the rules of causality to allow quantum superpositions. I've found that the simplest such relaxation, known as the quantum switch, unlocked speedups in quantum computing and quantum communication tasks. I worked together with experimentalists to demonstrate such advantages in the laboratory, demonstrating that it wasn't science fiction. I have also developed an algorithm, based on semidefinite programming, to produce causal witnesses, and thus determine whether a given causal structure was compatible with definite causality or displayed genuine quantum superpositions. I was also interested in the ultimate limits of such indefinite causality, and developed a mathematical test to determine which ones were compatible with the principle of conservation of information. Today the study of indefinite causality is a big area of research, and my results are considered foundational there, and the tools that I have developed were widely adopted.

More recently, my focus has changed back to the first question, and to the more applied side. I've investigated the statistical power of Bell inequalities, and designed an algorithm based on linear programming to optimize it, reducing the number of rounds necessary to obtain conclusive experimental data. I have developed a semidefinite programming hierarchy to compute the key rates in quantum key distribution numerically, which is a considerably more flexible and powerful technique than the methods hitherto available.

My research proposal builds upon my interest and expertise in quantum information and optimization theory. I propose to apply a very recent advance from optimization theory, the possibility of optimizing over non-symmetric cones, to quantum information protocols. As has been verified by preliminary results, the new technique allows for great performance gains over the state of the art, and thus make it possible to deploy new, more sophisticated protocols that use higher dimensions or more measurements, which were until now intractable. I also propose to further develop the non-commutative KKT conditions, which allow the characterization of the properties of ground states of many-body Hamiltonians, and accelerate the convergence of algorithms characterizing the set of quantum correlations.

**Resumen del Currículum Vitae:**

Throughout my career I have researched quantum information, both on the foundational side and on the applied side. My research has been motivated by the twin questions: what lies beyond classical mechanics, and what lies beyond quantum mechanics.

In the beginning of my career I was focused on the first question, researching Bell inequalities and noncontextuality inequalities. I've refined the mathematical tools to treat them, found new inequalities, and designed better experiments to test them. This work was very influential, as my techniques became standard in the field of contextuality.

Afterwards, my focus changed to the second question, and in particular what could happen if we relaxed the rules of causality to allow quantum superpositions. I've found that the simplest such relaxation, known as the quantum switch, unlocked speedups in quantum computing and quantum communication tasks. I worked together with experimentalists to demonstrate such advantages in the laboratory, demonstrating that it wasn't science fiction. I have also developed an algorithm, based on semidefinite programming, to produce causal witnesses, and thus determine whether a given causal structure was compatible with definite causality or displayed genuine quantum superpositions. I was also interested in the ultimate limits of such indefinite causality, and developed a mathematical test to determine which ones were compatible with the principle of conservation of information. Today the study of indefinite causality is a big area of research, and my results are considered foundational there, and the tools that I have developed were widely adopted.

More recently, my focus has changed back to the first question, and to the more applied side. I've investigated the statistical power of Bell inequalities, and designed an algorithm to optimize them, in order to reduce the number of rounds necessary to obtain conclusive experimental data. I have developed a semidefinite programming hierarchy to compute the key rates in quantum key distribution numerically, which is a considerably more flexible and powerful technique than the methods hitherto available.

Through my research I have developed expertise in optimization theory, semidefinite programming, polyhedral computation, quantum computational complexity, and quantum optics.

My research was developed in an extremely international manner. My formation was in Brazil, followed by a PhD in Austria, and postdocs in Germany, Austria, and Spain. This gave me a very wide network of international collaborators: I have worked with scientists in Australia, Brazil, Chile, France, Hungary, Japan, Singapore, Slovenia, Spain, and Switzerland.

I have disseminated my research not only by presenting it in national and international conferences, but also by giving interviews to journalists publishing it in popular media, and writing about it in my blog.

I have taught several lectures in the undergraduate and Master's level, including on quantum information and quantum computation. I have also supervised several Bachelor and Master theses.

More recently I've acquired responsibility for an entire research group at the University of Valladolid, where I'm managing 2 junior postdocs, 1 PhD student, 1 Master student, and 3 Bachelor students.

**Área Temática:** Ciencias físicas
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**Título:** Mass accretion and outflows in accreting compact objects

**Resumen de la Memoria:**

Mass transfer at astronomical scales, whether in the form of accretion or ejection, has been observed in virtually all branches of astronomy. These processes shape stellar evolution, return matter to the interstellar medium, and even dictate the history of galaxies. Despite the vast range of systems and scales at which it has been observed, they all share a common observational framework, with properties that can be extrapolated across different populations.

Interacting stellar binaries offer the perfect laboratories: they experiment events powered and regulated by accretion/outflows that evolve over typical timescales of ~days to months and repeat every few months to years. The most energetic events are exhibited by low-mass X-ray binaries (LMXBs). They are composed of either a neutron star (NS) or a black hole (BH), and a companion star lighter than the Sun. The companion stars overflows their Roche Lobe and trigger mass transfer onto the compact object, forming an accretion disc.

Throughout my career, I have made major contributions to the field of binaries with compact objects and their interaction with the environment. This is a crucial topic in modern astrophysics that addresses fundamental questions, such as the equation of state of NSs, the evolutionary history of binaries, and the outcome of mergers between compact objects that release gravitational waves (GWs).

In this document, I present a selection of my most representative contributions out of 60 refereed papers (12 as first author), which have amassed over a thousand citations. To cover my extensive work, I have split them into five complementary research lines, each representing different approaches to address key topics in the field. Together, they provide a comprehensive picture of compact objects and the accretion/ejection of matter over a wide range of spatial and temporal scales.

I have worked at three international institutions: the Netherlands Institute for Space Research, The University of Manchester and the Instituto de Astrofísica de Canarias. I have presented my findings at 22 international meetings, including 11 contributions as speaker, four of which were invited seminars. This has enabled me to establish a robust research network with esteemed experts, solidifying my position in the international scene. I have mentored 2 PhD and 4 master students, resulting in two second-author papers. I have been awarded hundreds of hours of observations in competitive calls at the largest available ground-based telescopes. I refereed international journals, organised scientific meetings, and joined 4 international collaborations, which expanded my research interests. My leadership in the field was recently acknowledged with the R3 certificate (2023).

As a result, I am uniquely positioned to integrate the techniques and knowledge I have acquired to enhance our comprehension of the most energetic events in the Universe. Recently, I implemented machine learning techniques to automatically detect outflows in LMXBs (the pilot study has just been published). My objective is to systematically analyse the spectroscopic properties of the full population using a similar approach. To achieve this, I will utilise a historical database containing thousands of hours of spectroscopic observations on hundreds of LMXBs.

**Resumen del Currículum Vitae:**

I began my research career with a PhD (2013-2017) at the Instituto de Astrofísica de Canarias (IAC), where I focused on studying neutron stars and black holes in low-mass X-ray binaries (LMXBs). After completing my PhD, I worked as a postdoctoral researcher (2017-2018) at the Netherlands Institute for Space Research (SRON, The Netherlands). By analysing LMXB candidates from the Galactic Bulge Survey, I gained expertise in managing large spectroscopic databases and expanded my research to different types of accreting binaries. I worked as a Research Associate at The University of Manchester from 2018 to 2021, where I was a key member of a project funded by the European Research Council. I was the leader of the team responsible for conducting spectroscopic optical and near-infrared analysis of Spiders, which are extreme binaries believed to be descendants of LMXBs. Additionally, I actively participated in four international collaborations dedicated to searching for electromagnetic counterparts of gravitational waves. Later, I obtained a post-doctoral position at the IAC (2021-2022), where I focused on studying the characterization of outflows in LMXBs. During my current postdoctoral position at the IAC (2022-2024), I founded and led the machine learning team of the X-ray binary group. Additionally, I expanded my studies to the field of ultra-compact binaries. Thanks to my combined expertise, I am now in a privileged position to study the accretion and ejection of mass across all scales from a multiwavelength and multidisciplinary approach.

I have published 60 refereed papers, including two in Nature, one as third author.
My research results are published in 12 first-author papers in international, refereed journals. Despite being early in my postdoctoral career, over two-thirds of my publications do not include my thesis supervisors among the leading authors. Including non-refereed publications, such as reports of new transient systems, I have 87 entries in NASA-ADS. According to NASA-ADS, my 60 refereed publications have accumulated over a thousand citations. Of these, 219 were achieved by the 12 papers in which I am the first author. This results in an H-index of 17. All of my publications follow open-access policies, enabling universal and free access to my work.

I have participated in 22 international workshops and conferences. I was a speaker in 11 of them, including 4 invited seminars. Through them, I have shared the results of my research and collaborated with researchers worldwide. I am an active member of four international consortia: GOTO, BlackGEM, EMBOSS, and the Vera C. Rubin Observatory consortium.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

I have also communicated my research to the general public through talks (Pint of Science, 2017) and written articles in newspapers (El día; 2021 – 2022). In 2017, I organised the 'La Gomera Accretion Week' conference, which brought together approximately 60 experts from around the world. Currently, I am organising monthly seminars for the Severo Ochoa and Compact Object research lines from 2021 to 2024. Additionally, Iam supervising a PhD student at IAC since 2022, and I have directed two master's degree theses at The University of Manchester from 2019 to 2020. Supervision of over a dozen more of PhD and master students ultimately led to the publication of two papers as second author.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias físicas |
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| **Título:** | Quantum Gravity Constraints on Precision Cosmology |

**Resumen de la Memoria:**

My research has focused on quantum gravity and cosmology. Specifically, my work has focused on inflation, dark energy, gravitational waves and their intricate interplay with UV frameworks of physics, such as string theory (ST) or supergravity. The results of my research have appeared in 31 publications of which 3 are single-author papers.

Among my most important contributions, let me list 3 of them:

[1] I am among the main contributors, who developed and investigated the peculiar properties of the "cosmological attractor mechanism" in the context of inflation. Specifically, I proposed the first single-superfield model of the cosmological attractor and showed that it originates from a deformation of the well-known "no-scale supergravity", which we dubbed "alpha-scale supergravity". These results were published in PRD and the article today counts 101 citations. Just after some months, I discovered how to include dark energy into that model. This was my first single-author paper, still as PhD student, and it was published in the high-impact factor JHEP (today it counts 71 citations).

[2] Later, during my first two postdoctoral appointments at DESY and KU Leuven, I investigated the effective description of spontaneous SUSY breaking. My work, in collaboration with Dr. Evan McDonough, discovered a new class of models, which has been extensively studied and cited by many other authors in recent years.

[3] I am one of the initiators of phenomenological applications of the Swampland programme. My solo work (Phys.Lett.B808(2020)135683) and my article with Irene Valenzuela (JHEP1908(2019)160) marks the very first papers concretely applying Swampland constraints to the case of cosmic inflation. In this works, we demonstrate the existence of a universal upper bound on the inflaton field range. Moreover, in 2021, together with Prof. Lüst and Dr. Cribiori (JHEP06(2021)071), I have proposed a new conjecture relating the gravitino mass to the Kaluza-Klein scale of extra dimension. This resulted in a very recent paper (JHEP05(2023) 060), where we find a prediction for the scale of supersymmetry breaking today of order TeV, which is within reach of LHC and of the next generation of hadron colliders.

I am recognized as one of the leaders working at the interface between string theory and cosmology. For this reason, I have been already invited twice to give a review lecture on my broad research: In 2022 I was invited to give a review lecture on "Cosmology and the Swampland" at the SCGSC 2022 in Amsterdam (NL);in 2019 I was invited to give areview lecture on "Anti-D3 brane and de Sitter space in String Theory" at the Avogadro Meeting ' 19 (Napoli, IT). Moreover, I am regularly invited to share my work and receive an average of eight invitations per year. Among the recent notable invitations, I would like to highlight being invited as a plenary speaker at the international conferences String-Pheno 2023 (in Daejeon, South Korea) and SUSY 2023 (in Southampton, UK) held in Summer 2023.

My research has garnered recognition through various prestigious awards. These include a Fulbright Fellowship for research at Harvard in 2024 and two prestigious Marie Curie fellowships.

I have visited several institutions for conferences, workshops, seminars and collaborations across 14 countries.

**Resumen del Currículum Vitae:**

I am a senior postdoctoral researcher at the Max Planck Institute for Physics in Munich and I work at the interface cosmology and theoretical high-energy physics. I am well known in my scientific community for my pivotal contributions in connecting cosmological observations to string theory and the swampland program.

I obtained my doctorate in June 2016 at the University of Groningen (NL). My first postdoctoral appointment was at DESY in Hamburg (DE), funded by 4 fellowships. Then, I was awarded a very competitive Marie Curie fellowship of 3 years to work at KU Leuven. I went then to Harvard University for a short postdoctoral appointment. After this productive period, I accepted a senior postdoc position in the string theory group led by Prof. Dieter Lüst at the Max Planck Institute for Physics in Munich.

As senior postdoc at the MPI for physics in Munich, I work on two main fronts: One is studying how UV degrees of freedom directly affect cosmological effective field theories (EFTs). Next to model-building, I employ a complementary perspective (commonly referred to as "Swampland program"), which has recently taught us that the analysis at the EFT-level may reveal universal features that a top-down investigation might just miss. The second front is instead a more phenomenologically focused (and often framework-independent) study of inflation and gravitational waves. Besides being very effective, this twofold approach allows me to easily interact with two communities that sometimes struggle to convey their message to one another. For the future, I plan to combine these two aspects of my research and take the lead in applying cosmological techniques to the quantum gravity research program.

I have been fortunate enough to collaborate with some of the top scientists in the field. After working alongside Prof. Juan Garcia-Bellido at UAM Madrid, I was awarded two grants to spend 3 months at Stanford University. My collaboration with Prof. Andrei Linde and Prof. Renata Kallosh has

been precious in terms of personal growth and scientific output (with two publications, one without my supervisor). Between 2016 and 2017, I worked with Prof. Westphal on string theory cosmological models. In April and June 2019, I was appointed at Harvard University to work with Prof. Matthew Reece and reinforce my knowledge on the Swampland program and its phenomenological applications. At KU Leuven, I had instead the privilege to collaborate and interact with world-leading experts in supergravity and string-phenomenology such as Prof. Van Proeyen and Prof. van Riet. Today I can count on a very broad and international collaboration network.

My work has been repeatedly acknowledged through regular invitations as seminar speaker at different physics institutions (an average of 8 invitations per year) and as plenary speaker at a number of international conferences and workshops per year. In 2023 I was invited as plenary speaker in two of the most important conferences in my field, namely the international conference String Phenomenology 2023 (in South Korea in July) and the SUSY 2023 conference (in Southampton in July).

I have been quite successful in retrieving research funding having attracted a total amount of more than 920.000 Euro. I have also been awarded a Marie Curie fellowship twice and a prestigious Fulbright fellowship.

| **Área Temática:** | Ciencias físicas |
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| **Título:** | Testing the dark sectors of the Universe with joint analyses of galaxy survey probes |

**Resumen de la Memoria:**

My research interests are focused on better understanding the nature of the dark components by combining different cosmological probes.

During my career I have developed a large expertise on the combination of galaxy survey probes. Starting with my PhD, I produced the official Euclid forecasts, showing that a combined 3x2pt analysis (photometric galaxy clustering, weak lensing, and galaxy-galaxy lensing) will improve the constraints on dark energy by a factor of 4. During my postdoctoral positions I continued working on Euclid and co-led the preparation of the photometric galaxy clustering pipeline. Although this provided me with a more theoretical background, I also gained significant experience on cosmological simulations and real data analyses during my postdoctoral positions. I developed a pipeline able to calibrate galaxy mocks in a fully automated way and used in the Dark Energy Survey (DES). I also had a major role on the checks for systematic effects in the galaxy-galaxy lensing analyses of DES. Since 2022 I hold a permanent position and I have been recently appointed as co-lead of the 3x2pt effort with the first data release of Euclid. Beyond Euclid, I also test extended models beyond LCDM with relativistic effects and model-independent analyses.

The main objective of the proposed line of research to be developed is twofold. Focusing on the first data release of Euclid, I plan, first, to properly combine the main cosmological probes (spectroscopic galaxy clustering and 3x2pt) considering the covariance between them. In a second step, I plan to test theoretical models extending both dark matter and dark energy beyond LCDM. For the latter, I will make use of the cross-correlations between the different cosmological probes, which will allow us to extract the maximum amount of information from the data. The proposed research will provide an added value to the scientific return of the Euclid mission (and other future galaxy surveys). It will allow us to explore the data sets beyond the current approach, which is a separate analysis for spectroscopic galaxy clustering and 3x2pt. The proposed joint analysis may be key to providing answers to the open questions that surveys like Euclid will address.

This line of research will strongly benefit from my position as co-lead of the 3x2pt effort with the first data release of Euclid. It will also benefit from my experience on real data analyses from DES, the production of cosmological simulations, the theoretical modeling of Euclid observables (including the correlation between different probes), and my implication in the official Euclid pipelines. However, it tackles a currently unsolved issue, which is to combine photometric and spectroscopic data without loss of information. Therefore, this line of research extends my previous experience towards a fully joint and consistent analysis of all Euclid data. The outcome of this research will consider all Euclid information, and hopefully will shed some new light into our dark Universe.

**Resumen del Currículum Vitae:**

My research interests are focused on better understanding dark energy and dark matter by combining different cosmological probes.

I obtained my PhD at IRAP in 3 years. It was focused on the combination of galaxy clustering and weak lensing in Euclid and the prediction of the role of cross-correlations between these probes, also known as galaxy-galaxy lensing. I showed that doing a combined 3x2pt analysis (photometric galaxy clustering, weak lensing, and galaxy-galaxy lensing) will increase the dark energy figure-of-merit by a factor of 4, which is needed to achieve Euclid's scientific goals. I co-led the cross-correlation analysis, and it was awarded with the Euclid STAR prize and the Paul Sabatier PhD prize.

Although my PhD was more focused on theoretical predictions, I gained significant experience in cosmological simulations and real observations during my postdoctoral positions. I developed a pipeline to self-calibrate simulated galaxy catalogs against observations (used in DES) and I had a major contribution to the checks for systematic effects in the galaxy-galaxy lensing analysis of DES. I also studied nonlinearities and baryonic effects, and I prepared the photometric galaxy clustering analysis in Euclid.

I obtained a permanent position in 2022. Since then, I have strongly contributed to the preparation of the 3x2pt pipelines in Euclid. I have also considered the relativistic dipole in the cross-correlation of galaxies, showing that it will be detectable in DESI data. Finally, I have considered the DESY3 data to measure, for the first time, the evolution of the Weyl potential in a model-independent way.

My work has led to a total of 121 publications (first or second author in 18 and major contributor in 44) with 3236 citations and an h-index of 29. I have also been an invited speaker to 12 conferences and given 25 contributed talks and 18 seminars.

During my career I have obtained 312k€ in funding as PI, which include 18k€ in scholarships, 72k€ in a predoctoral fellowship, 203k€ in a MSCA individual fellowship, PRIMROSE (in the top 25 applicants out of 993 proposals), and 19k€ for the organization of the 2024 Rodolphe Clédassou PhD summer school. As co-PI, I further obtained 210k€ for the organization of the 2025, 2026, and 2027 sessions of the same school.

I have developed leadership and managing skills within Euclid. I co-lead the 3x2pt work package, in charge of the 3x2pt analysis with the first data release of Euclid. I also co-lead the work package producing forecasts for models beyond LCDM and the work package to prepare the photometric galaxy clustering analysis. I have also been the secretary of the Euclid Consortium Board for 2 years and the chair of the ICE journal club for 3 years.

Since 2023 I am a member of the Euclid STAR prize committee. I am a builder of the Euclid Consortium and I am also a member of UNIONS, DESI (external), and DES (former).

I co-supervise 2 PhD students and co-supervised 7 MSc and 2 BSc theses. I am a referee of high-impact scientific journals and of observing proposals. I have given more than 300h of lectures and problems courses. I have been in the SOC of 1 conference and the LOC of 8 PhD schools and 2 conferences. I am the director of the Rodolphe Clédassou PhD summer school, and I have also been active in outreach activities with seminars for the public and articles in the media.

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| **Área Temática:** | Ciencias físicas |
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| **Título:** | R&D for next generation of neutrino experiments |

**Resumen de la Memoria:**

Dr. Simón's career has centered on developing experimental techniques for pushing the understanding of the neutrino. Most of his career has focused on neutrinoless double beta decay (bb0nu) searches in the context of NEXT. Detecting such process would clarify whether the neutrino is a Majorana fermion, one of the biggest questions that have yet to be answered in the field.

NEXT is a leading bb0nu experiment which has developed the technology of high pressure xenon gas TPCs with electroluminescence amplification of the signal (HPGXe EL-TPC), through the construction and operation of successive generations of apparatus. NEXT is equipped with dedicated sensor planes which allow for simultaneous energy and track reconstruction. Such combination strongly boosts the background rejection capabilities of the technique and is the flagship feature of NEXT.

The researcher has played a major role in the experiment since early stages. He made numerous and important contributions to NEXT, ranging from participating in the construction of the main apparatus, to acting as Run Coordinator, one of the most important roles in the experiment. He made critical contributions to the physics of NEXT too. He developed the reconstruction of electrons (a unique capability of the HPGXe technology) and applied his knowledge of the optical properties of the TPC to achieve, through deconvolution techniques, an extraordinary performance in background suppression, a factor 5 better than the original NEXT target.

He recently expanded his research interests and is now a key part of 2 ERC awarded experiments, CoSI and GanESS, which will do precision measurements of coherent elastic neutrino-nucleus scattering (CEnuNS) at the European Spallation Source. Improved CEnuNS measurements will allow to deepen our knowledge of several neutrino properties. CoSI and GanESS propose the use of 2 completely different techniques. CoSI will deploy pure CsI scintillators operated at 80K while GanESS will use a HPGXe EL-TPC, akin to NEXT. Their combination offers a unique approach as their response to CEnuNS is mostly identical given their similarity in nuclear structure, but their technologies and systematics are nothing alike. The simultaneous use of these detectors will serve to reinforce, or refute, any hint of unanticipated observations.

He has taken responsibility of all aspects of GaP, a GanESS prototype, for quenching factor measurements. He is developing low-energy calibration procedures for GaP, which will result in the first measurements of the QF in gaseous noble gases. Dr. Simón has a deep understanding of semiconductor detectors as he independently designed, fabricated and tested large area avalanche silicon photodiodes as light sensors for CsI crystals.

His research will focus on further developing the experiments he is currently associated with as well as pursuing new investigation lines. He'll take part in the NEXT-100 detector operation and data analysis and will be involved in R&D tasks of the future NEXT-HD detector (a ton-scale version of the technology). He'll keep close involvement with GanESS and CoSI, where he already plays a leading role (software convener and lead analyst). He also plans to develop a novel TPC conical design with the goal of exploiting single-phase EL in liquid noble gases for CEnuNS detection.

**Resumen del Currículum Vitae:**

During his PhD he was closely involved in the operation of the NEXT-DEMO detector. He supported hardware interventions and developed various reconstruction tools and algorithms that laid the basis of future developments, with a strong focus on tracking algorithms.

He took part on the hardware developments of NEXT-White, including characterization of SiPMs used in the detector and the TPB coating of the detector's inner parts. He was closely involved in NEXT-White deployment and in its commissioning. This helped him achieve a profound understanding of all aspects in the operation of a time projection chamber. Consequently, he was named Run Coordinator of the experiment as soon as he obtained his PhD. As Run Coordinator he ensured the smooth daily operation of the detector at all levels, with a strong focus on evaluating and configuring the DAQ system of the detector. He coordinated the software and hardware team involved in the operation, accounting for more than 70 persons.

He was part of various analysis of NEXT-White and lead 2 of them. He was one of the leaders of the calibration taskforce and characterized the optical response of the detector. He implemented a novel reconstruction algorithm, based on Richardson-Lucy deconvolution, which critically improved NEXT's background rejection.

He devoted the last few years to R&D efforts. He took responsibility of the first phase of the cold gas program of the experiment, AXOLOTEL at Ben-Gurion University of the Negev (BGU), becoming proficient in cryogenic operation. He coordinated the group at BGU with the rest of the experiment. The israeli group joined the collaboration by the time Dr. Simón finished his PhD and, as part of his post-doctoral involvement, supported by a Kreitman Foundation fellowship, Dr. Simón was in charge of the successful integration of the group within NEXT and supported two PhD students. He was closely involved with the NEXT-DEMO++ detector, an upgraded version of NEXT-DEMO which is used as a testbench for tracking plane solutions, gas mixtures and electroluminescence studies.

Dr. Simón has been awarded with a MSCA-IF-GF fellowship, taking place currently in Donostia International Physics Center after a 1 year secondment at University of Chicago. The goal is to characterize the response of both cryogenically operated CsI crystals (CoSI project) and a high pressure noble gas TPC (GanESS project) in the few keV range. Such detectors will be used in the European Spallation Source to measure coherent elastic neutrino-

nucleus scattering. As part of this work, he has designed and developed the full procedure for building large area APDs from scratch. He is finishing the analysis to characterize CsI's quenching factor below 1 keV and has taken responsibility of all aspects of GaP, a GanESS prototype, for quenching factor measurements. As software convener of GanESS, he's in charge of developing the software framework for analysis and simulation. He is coordinating the team involved in the neutronics background simulation of the ESS.

Dr. Simón is a highly independent and multi-faceted researcher, extraordinarily competent in all experimental steps with strong management and coordination skills as demonstrated by the key responsibility roles he has covered in experimental collaborations on topics as different as Run Coordinator, software convener or lead analyst.

**Área Temática:**     Ciencias físicas
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**Título:**     Imaging in nuclear medicine and development of radiation detectors

**Resumen de la Memoria:**

I am an Associate Research Professor (Associate Professional Researcher) and junior Principal Investigator in the Radiology and Biomedical Imaging department of UCSF. I lead research in radiation detectors and imaging techniques for nuclear medicine. I have more than 13 years of experience in nuclear and particle physics, having led major contributions in the field of nuclear medicine and experimental neutrino physics. My current publication record is of 49 publications with an H-index of 33 and number of citations equal to 6450 (source: Google Scholar). I have invented cutting-edge technology which is currently considered for a patent. I have mentored ten graduate and undergraduate students. I have been honored with research awards such as the Breakthrough Prize 2016.

I am currently leading a group with two postdoctoral researchers, two graduate students and two undergraduate students. In the past three years I have raised more than $1M/yr in external funding. The main research lines of my group consist of the development of novel technology to enable new applications and improve single-photon emission computed tomography (SPECT) and positron-emission tomography (PET). These projects are better described in detail below.

My career has been defined by interdisciplinarity: my early career was in fundamental neutrino physics, while I currently lead research in radiation detection in nuclear medicine. My PhD was at the Institut de Física d' Altes Energies (IFAE, Barcelona), and my postdoc period continued in other top institutions such as the University of California Berkeley and the Lawrence Berkeley National Laboratory. During this period, I coordinated three working groups in international collaborations (Spain, US, Canada, Japan, UK) and played the role of lead scientists in a Research & Development program for radiation detectors. The roles I played resulted in a number of contributions to the field (see below). I currently employ the knowledge and skills I acquired during those years on radiation detection to spearhead discovery and innovation in nuclear medicine as a junior PI. I strongly believe that my interdisciplinarity is a strong asset for my career and my scientific production. One of my passions is the translation of technology from the more fundamental fields (e.g. neutrino physics) to nuclear medicine, as informed by my contributions below.

Because of my non-traditional career, I have divided my contributions in those relevant for imaging in nuclear medicine and radiation detectors, and those relevant only to neutrino physics.

**Resumen del Currículum Vitae:**

I am an Associate Research Professor (Associate Professional Researcher) in the Radiology and Biomedical Imaging department of UCSF, leading research as a principal investigator in radiation detectors and imaging techniques for nuclear medicine. With my background in nuclear and particle physics, I have more than 13 years of experience in radiation detection, physics modeling, and data analysis, and I currently lead independent research in imaging in nuclear medicine. I stablished my own research group with two postdocs and several students, funded with more than $1M/yr in external awards as a sole PI. My current publication record is of 49 peer-reviewed articles, an H-index of 33, and 6450 citations (Google Scholar). I have led working groups in international collaborations and research consortiums of top institutions. I have also invented cutting-edge technology which is currently considered for a patent. I supervise postdocs and students, I am part of the steering committee of a local research interest group, and I have coordinated a science outreach group.

I am currently the principal investigator of a group with two postdocs, two graduate students and two undergrads. I am also the leader of two consortiums that involve top institutions (Berkeley Lab., UCSF, Brookhaven National Lab. and UC Davis). These collaborations were formed after the National Institutes of Health awarded me with an R01 ($3,577,396 for 4 years) and an R21 Trailblazer ($646,000 for 3 years). They both are highly competitive funding mechanisms with paylines above 18%. I have also stablished a network with the material and nuclear imaging industry (Redlen Technologies, IDEAS, Nuclear Fields, Hamamatsu) and I am actively collaborating with them to develop novel detector and scanner technologies.

I am leading the renovation of SPECT using new concepts and systems in order to provide imaging of very low activities of therapeutical radionuclides, an unmet need in the field of nuclear imaging. I obtained the first pre-clinical images of Ac-225, a popular alpha emitter used in targeted alpha therapy, and I spearhead two efforts to improve SPECT imaging: one based on Compton imaging combined with proximity imaging, an original invention on the way to be patented, and another one employing cutting-edge technology (solid-state detectors and tungsten collimators) to dramatically improve the performance of SPECT. On another research line, I am pioneering a new optical detector technology to improve imaging with PET based on Cherenkov and scintillation separation in scintillator crystals, which is a technology originally developed for neutrino detectors and for which I played a critical role. This R&D program on development of optical detectors resulted in 5 first-author papers with more than 50 citations each, and numerous conference contributions and invited presentations.

Other highlights are that I was appointed group leader of three different working groups: atmospheric neutrino group of the SNO experiment, the solar neutrino group and the PMT calibration group of the SNO+ experiment. These are international collaborations with hundreds of members, in which individual working groups had tens of them.

**Área Temática:** Ciencias físicas
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**Título:** Investigadora postdoctoral en tecnologías cuánticas

**Resumen de la Memoria:**

My research endeavours are focused on the cutting-edge domains of quantum science and technology (QST), leveraging my proficiency in quantum control and machine learning (ML). My research contributions can be classified into quantum transport, quantum control, quantum machine learning and quantum sensing.

I initiated my research career in mesoscopic transport in semiconductor nanostructures, delving into the fundamental quantum physics related to tunneling phenomena and electron transport properties. Undeterred in my pursuit of understanding it, I have been studying electron transport in solid-state physics with applications in quantum information processing, which provides the important platform to do quantum technologies.

Since PhD, I have been working in the realm of quantum control in solid-state physics, specifically via Shortcuts to Adiabaticity (STA). For reliable qubits for semiconductor quantum dot (QD)-based quantum computers, I devised fast and robust control protocols for electron/hole spin/charge qubits in various QD systems. By designing the evolution trajectory as desired, with an operation time shorter than adiabatic scale, the protocols that I designed successfully mitigated decoherence to a large extent and suppressed systematic errors. I did the pioneering work on fast and robust spin control in quantum dots using Shortcuts to Adiabaticity (STA) [Phys. Rev. Lett. 109, 206602 (2012)] (first author) and further investigated long-range spin/charge qubit transfer in solid-state physics by extending STA from two-level to multi-level systems.

Not only providing stable platforms to do quantum computing, quantum control has proven instrumental in developing innovative quantum algorithms. As a main researcher in UPV/EHU funded by EU FET Open Project Quromorphic, I introduced the idea of designing non-adiabatic versions of quantum perceptrons for reducing the perceptron gate time and quantum perceptrons with multi-qubit interaction to facilitat the scaling up of quantum neural networks. Besides quantum machine learning, I did a series of work on improving variational quantum algorithms for digital quantum simulation pertinent in the NISQ era in the last year with preprints available on arXiv, also see my publication list on Google Scholar.

I have integrated neural networks (NNs) into quantum sensing/metrology. This combination extends the working regime of quantum sensors, going beyond harmonic shape, amidst significant shot noise. My theoretical work was experimentally verified by collaborating with experimentalists of USTC [npj Quantum Inf. 8, 152 (2022)] (co-first author). Moreover, in this experimental work, I introduced a new concept highlighting the breakthroughs of single-shot measurements for continuous sensor interrogation where reinitiating the system is impossible.

The above research portfolio underscores my commitment to pushing the boundaries of QST and establishing bridges between different areas, enriching new fields. Based on my background in quantum transport, quantum control, quantum algorithms and quantum sensing, I will be dedicated to continuously developing the research line " quantum-control-inspired algorithms for quantum technologies" .

**Resumen del Currículum Vitae:**

My research activities are dedicated to quantum science and technology (QST), with focused commitments to advancing quantum control, quantum computing, quantum sensing.

All my experience in academia and industry, foster abilities to develop my independent research lines in Spain. In 2013, I obtained PhD in the University of the Basque Country (UPV/EHU) with Thesis "Effects of spin-orbit coupling in quantum semiconductor systems" under the guidance of Prof. E. Sherman. In PhD studies, I did the pioneering work on fast and robust spin control in quantum dots using Shortcuts to Adiabaticity [Phys. Rev. Lett. 109, 206602 (2012)]. Later when I was holding a permanent position in Shanghai University and was working in ICMM-CSIC as a Juan de la Cierva fellow, I further investigated long-range spin/charge qubit transfer in solid-state physics. In the periods of being a main researcher in UPV/EHU funded by EU FET Open Project "Quromorphic" and a senior researcher at TECNALIA, I focused on studying quantum machine learning and quantum sensing, developing quantum-control-inspired protocols tailored for the NISQ era. This diverse research portfolio underscores my commitment to pushing the boundaries of QST and establishing bridges between different areas, enriching new fields.

I am the co-author of 48 publications with 974 citations and h-index of 18 [Google Scholar], including 1 Phys. Rev. Lett., 1 npj Quantum Information, 2 Quantum Sci. Technol., 16 Phys. Rev. Series and 1 Review (highlight of 2013 in Journal of Optics). I serve as a referee for prestigious journals such as Phys. Rev. Lett./A/B/Applied and project evaluation for the National Natural Science Foundation of China. I was as one of the guest editors for the Theme issue on Shortcuts to Adiabaticity: Theoretical, Experimental, and Interdisciplinary Perspectives, published by Philos. Trans. R. Soc. A (ISSN: 1364-503). My international collaborations span diverse research domains, including quantum control, quantum technologies, and machine learning. For instance, the collaboration with experimentalists from USTC, China, verified my theoretical work [Phys. Rev. A 103, L040401 (2021)], [Quantum Sci. Technol. 6, 045012 (2021)] into experiments [Sci. China: Phys. Mech. Astron.], [npj Quantum Information 8, 152 (2022)].

I am showing clear signs of independence and leadership, by innovating new ideas and lines of research, putting together different techniques and areas of physics and fostering collaborations. I got R3 certificate on Nov. 2023. Actively involved in the mentorship of young researchers, I am the co-supervisor of two on-going PhD students in UPV/EHU and have directed 6 master Thesis and 1 undergraduate student Thesis. I was PI of two national

and two provincial projects on quantum control from China and participated in several European projects Quromorphic, Epiqus, OpenSuperQPlus100 as a main researcher. As PI of the project "CUCO: Quantum Computing and its Application to Strategic Industries" supported by Ministry of Science and Innovation of Spain, I developed a new quantum kernel [arXiv: 2401.04642] and led the work on variational quantum algorithms [arXiv:2310.12179; 2310.09826]. Due to my passion for quantum technologies, from Dec. 2023 I work as a postdoc in UC3M. Leveraging my background and leadership, I have the abilities to develop my own independent research lines.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | DANIELSKI , CAMILLA |
| **Referencia:** | RYC2023-044903-I |
| **Correo Electrónico:** | camilla.danielski@gmail.com |
| **Título:** | A global approach to the formation and evolution of planetary systems |

**Resumen de la Memoria:**

My research line focuses on the formation and evolution of planetary systems. Since my PhD thesis I have pursued several themes of research on the different aspects of the atmospheric characterisation of planets, planetary evolution and stellar characterisation. I have developed a broad experience in the development, calibration and study preparation of multiple space missions for the investigation of exoplanets, and my knowledge spans different methods for their detection and characterisation: transits, direct imaging, astrometry, microlensing, and gravitational waves. In particular, I specialised on different aspects of exoplanetary science, examining the different planetary populations both from the point of view of observations and simulations. Primarily, I focused on tracing the life of giant planets from their young age (planets that we can observe through direct imaging), via their adult age (when they have short periods, and they transit their star), until the old age (when they survive the evolution of their host star/s and orbit white dwarfs).

Within the framework of planetary evolution, from formation to the last moments of the life of these objects, the community's attention has been mainly focusing on exoplanets orbiting Main Sequence stars. The fate of exoplanets when their star/s leave/s the Main Sequence remains an open subject of discussion, and it is characterised by many unknowns that we still have to constrain if we want to obtain a coherent vision of the planets outside our Solar System. In this context, I have created and launched a new original research line on the modelling and search for exoplanets orbiting double white dwarfs. The study of this yet unprobed population contains key information about the last phases of a planetary system. Up to today the typical faintness of these stars hindered their detection. By widening my expertise to the gravitational waves subject I have developed a method to find giant exoplanets, orbiting white dwarf binaries, via gravitational wave astronomy with the LISA mission. This technique overcomes the past difficulties in the observation of double white dwarf systems and gives us a mean to increase the statistics of evolved exoplanetary systems everywhere in the Milky Way and in the Large Magellanic Cloud. On this point, I am leading the theoretical development of the long-term evolution and second-generation formation of exoplanets beyond the Main Sequence, in the framework of the advancement of the LISA planetary detection science case.

My academic profile lies exactly at the crossroads of exoplanet characterisation and stellar characterisation. Knowing the stars, their age and their stellar abundances is the founding stone for interpreting the composition and, hence, the origin and evolution of planets. As the leader of the "Stellar characterisation" WG of the Ariel Consortium I work on the homogeneous characterisation of the Ariel stars. In this regard, I have been coordinating for the last five years ground and space-based monitoring of the Ariel stars to obtain the data needed for building a public catalogue of homogeneous and self-coherent stellar parameters. In synergy with planetary formation experts, I also work on the identification of environmental factors that shape planetary systems and the signatures they leave in the planet compositional and orbital characteristics

**Resumen del Currículum Vitae:**

I obtained MSc and PhD at UCL (UK, 2010 and 2014). I worked as a CNES Fellow at the Paris Observatory and Research Associate at the IAS and CEA (France). I was a Severo Ochoa Research Associate at the IAA (Spain). Finally, I ranked first in the INAF Italian fellowship competition, and I moved to the Arcetri Astrophysical Observatory. I contributed to 38 peer-reviewed papers, 16 of which as the lead or co-lead author (among these 1 Nature, 1 Nature Astronomy and 1 Nature Astronomy in review). Two of my 2023 co-led papers are the outcome of MSc theses I supervised. In my first Nature Astronomy paper, I merged for the first time the exoplanets and gravitational waves fields, opening a new window on the study of exoplanets, providing for the first time the possibility to probe for such a population everywhere in the Milky way and nearby galaxies. In my Nature paper we discovered the first confirmed exoplanet orbiting a white dwarf through microlensing.

I obtained more than 234 k€of funding for financing my own research. I have been internal panellist on the Planets and Planet Formation panel (2021) of the NASA Hubble Space Telescope, and I am a TAC member at the Calar Alto Observatory. My expertise within the field is recognised by the large number of awarded observational campaigns with more than 422h as PI, and more than 900h as Co-I (84.3h of which on JWST, 310h on CHEOPS). I contributed writing the Ariel mission proposal, and sections of the Yellow and Red Books. I wrote several proposals and technical reports for ESA, and 5 white papers. During 2018-2021 I was Executive Committee member of the IAU Junior Members Working Group (WG), acting as a world-wide representative of the IAU Junior Members. Since 2023 I work as unique editor of an academic book on the detection methods of exoplanets.

I have an excellent international exposure which can be accounted for by more than 50 talks in seminars and conference talks (of which 15 invited) in Europe and USA. Since 2017 I have been science organiser and chair in committees for 10 international conference sessions and 1 workshop. I participated in many international projects and collaborations (Gaia, ExoplANETS-A, JWST ERS/GTO, MIRI, Ariel, LISA, CARMENES). I am visiting astronomer of the PLANET microlensing network. In 2022 I won two ISSI team grants to work on 2 international projects.

I am the scientific leader of the "Stellar Characterisation" WG of the Ariel Consortium and the scientific leader of the interdisciplinary team within the LISA Astrophysical WG, coordinating the development of the science case on planetary detection with GWs. In 2020 I won an honourable mention by the Gravity Research Foundation. I am the leader of synergy projects between the Ariel and both CARMENES and CHARA/SPICA consortia for the characterisation of Ariel stars. I was awarded the CNES Fellowship by the French Space Agency (2015) and the IAF astrophysics fellowship by the INAF (Italy, 2023).

I have been supervising students from BSc to PhD level. I wrote 2 articles and imparted 10 talks through the media (newspapers, radio, tv, podcast) and in person in Italian, French, Spanish, English, as part of my activity in scientific outreach. I was a tutor for the University diploma program (Paris Observatory), and I taught a course on exoplanets to secondary school children with learning difficulties (France).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Ciencias físicas
**Nombre:** DUARTE CAMPDERRÓS, JORGE
**Referencia:** RYC2023-044327-I
**Correo Electrónico:** duarte@ifca.unican.es
**Título:** Exploring Frontiers in Particle Physics Research

**Resumen de la Memoria:**

As a particle physicist, I am exploring the frontiers of Elementary Particle Physics (EPP) with two main lines of research: exploring potential new phenomena in EPP by exploiting hadron colllider data and advancing particle detection technology. My contributions span several experiments and collaborations, including CMS, ATLAS, and DAMIC-M, as well as RD50 and AIDAinnova.

I have analyzed data from the two general purpose detectors at the LHC, CMS and ATLAS, and have been involved in a variety of studies including Standard Model diboson measurements, B-physics investigations, and various technical and operational tasks. These tasks included event selection for Higgs boson searches, especially prior to its discovery. In a subsequent phase of my research, I shifted my focus to the exploration of phenomena beyond the Standard Model, with an emphasis on identifying signatures of long-lived particles. In collaboration with a select group of phenomenologists, we've delved into the design and exploration of a new "s-tagger" specifically tailored for future electron-positron colliders.

Initially, my detector R&D efforts focused on software and methodology improvements, including tasks such as integrating full simulations for forward tracker disks and refining them for optimal performance. I also contributed to the development of the large radius tracking algorithms used in ATLAS. However, my role expanded significantly with the CMS Phase 2 upgrade for the HL-LHC project. Here I was involved in a wide range of activities from detector characterization and experimental infrastructure commissioning to experiment coordination, electronics design and data analysis, both in the Inner Tracker and the MTD ETL projects. Recently, I have included other activities related to enabling technologies such as iLGADs as a potential Tracker 4D, or more prospectively, such dark matter searches with quantum sensing. I also joined a collaboration (DAMIC-M) for the construction of a direct dark matter search experiment using silicon sensors (CCD).

Regarding knowledge transfer, I have initiated some activities with the Hospital de Valdecilla of Santander. These collaborations focus on preparing for the upcoming installation of the new proton therapy unit. I am also involved in projects related to radiotherapy dosimetry and simulations, further extending the application of particle physics expertise to real-world medical applications.

For almost 16 years, I have been involved in the activities described, starting with my affiliation with the IFCA group in Santander, Spain, in 2008. After completing my PhD in February 2014, I undertook a postdoctoral journey that included almost three years at Tel Aviv University, followed by nearly six years at CERN, which concluded in May 2022. During this time, I have made significant contributions to various research projects and collaborations, including particle physics experimentation, instrumental advancements, and knowledge transfer initiatives. My return as a Maria Zambrano Fellow in mid-2022 signifies my continued dedication to advancing scientific knowledge and fostering interdisciplinary collaborations.

**Resumen del Currículum Vitae:**

I am the author of more than 1000 articles, of which I am the main author or direct contributor of about 30. I have given many talks at international conferences and workshops (24), both as an individual contribution and on behalf of one of the collaborations (ATLAS, CMS, ILD or RD50). In the experiments I have participated in, I have performed data analysis and contributed to the R&D, commissioning and operation of the experiments, taking responsibility and leadership roles in several projects.

I have supervised 8 undergraduate projects (6 TFG, 1 CERN summer student, 1 JAE intro), 4 TFM and Ph.D. thesis. Currently I am supervising 1 TFG, 1 TFM and 2 Ph.D. theses. I also teach one undergraduate (Particle Physics) and two masters physics courses (Particle Physics, Programming in the Scientific Environment) at UC.

I hold the "Ayudante Doctor" accreditation issued by ANECA and the "Certificado I3" from the Agencia Estatal de Investigacion, which recognizes outstanding research career and scientific activity. I've been honored with the prestigious Maria Zambrano talent attraction program. Furthermore, I've served as a member of tribunals for TFG and Master thesis, reviewed proceedings for VERTEX2017, acted as an external expert for a national call in Peru, and provided technical expertise for DNV. Additionally, I've also served as an editor for the Journal of Nuclear Engineering.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | NOGUERAS LARA, FRANCISCO |
| **Referencia:** | RYC2023-044924-I |
| **Correo Electrónico:** | fnogueraslara@gmail.com |
| **Título:** | Understanding the Galactic centre in the context of Galaxy formation and evolution |

**Resumen de la Memoria:**

I am an expert in photometric and astrometric data, interstellar reddening, dense stellar systems, non-standard observing techniques, and the analysis of red giant stars. My research is focused on understanding the Milky Way's centre, its structure, stellar population, and formation. The Galactic centre is the closest galaxy nucleus and the only one where we can study the physics of a galaxy nucleus in detail. It is also a high-redshift star-forming region analogue given its extreme conditions and star formation rate. My major scientific contributions have been 1) The detection of an excess of young stars in the Galactic centre. I led this work that was published in Nature Astronomy (2022) and contributed to understand the Galactic centre missing young stars problem. It was the subject of international press releases (e.g. MPIA, ESO). 2) The determination of the star formation history of the Milky Way's centre. I was the leading and corresponding author of another Nature Astronomy study that challenged the previously accepted paradigm of quasi-continuous star formation in the Galactic centre. This work was the subject of numerous international press releases (e.g. ESO, Nature, CNN). 3) The GALACTICNUCLEUS catalogue, a high-angular-resolution JHKs survey that constitutes the most complete Galactic centre catalogue to date. I played a key role in designing the observing strategy, developing a pipeline to reduce the non-standard data, and making the catalogue available to the community. Other relevant contributions are: 1) Characterisation of the near infrared extinction curve (5 papers, 4 as first author), and publication of the most detailed near infrared extinction maps of the Galactic centre. 2) Analysis of the connection between the nuclear star cluster and disc, finding that they might belong to the same larger structure. 3) Study of the Sgr C region to understand the evolution of young stars in the Galactic centre. 4) Analysis of the number, distance and properties of the Milky Way's spiral arms towards the Galactic centre. 5) Characterization of the innermost Galactic bulge stars. 6) Measurement of the line-of-sight extent of the Galactic centre.

I have demonstrated leadership publishing 17 papers as first author (3 as single author), and obtaining prestigious fellowships to carry out my projects as PI (ESO and Humboldt fellowships). I have been PI of 7 successful observing proposals (~180 hours) at the VLT (ESO), particularly a 98 hours KMOS program to study Galactic centre stellar metallicities and kinematics. I am an UT4 night astronomer and an ERIS fellow, with duties in Paranal (40 nights/year) giving me a unique perspective on VLT instruments and observing proposal preparation. During my international post-doc positions (MPIA, ESO) and PhD (IAA), I have built a fruitful international network that allows me to collaborate with experts from all over the world and carry out frequent research stays (e.g. UCLA, OCA, Vienna Observatory) to put my research into a wider context. I am part of large international collaborations such as the ACES project (The ALMA CMZ Exploration Survey), or the KMOS team to characterise the nuclear stellar disc. I have also significant teaching experience (UGR, 17 ECTS), and am co-directing a PhD thesis, and (co-)supervising 10 students (PhD, master, and bachelor level).

**Resumen del Currículum Vitae:**

I am an ESO Fellow working on the structure, stellar population, and formation of the Milky Way's centre.

Scientific contributions: 44 refereed papers (1073 citations, 17 first author, 3 single author), available in open-access journals or on arXiv. I have been invited to give 6 talks at international conferences, 25 colloquia/seminars at international research centres, and presented 7 contributed talks and 9 posters at international conferences. Three major milestones of my career: 1) The detection of an excess of young stars in the Galactic centre (Nogueras-Lara et al. 2022, Nat. Astron., 6, 1178). I led this work contributing to understand the Galactic centre missing young stars problem. 2) The determination of the Galactic centre star formation history (Nogueras-Lara et al. 2020, Nat. Astron., 4, 377). This study challenged the previously accepted paradigm of quasi-continuous star. 3) The GALACTICNUCLEUS survey (Nogueras-Lara et al. 2019, A&A, 631, A20), a high-angular-resolution JHK imaging survey that constitutes the state-of-the-art Galactic centre survey.

I have published two outreach articles (IAA, The Conversation), and given 5 outreach talks. I have also designed a project to teach astronomy to high-school students via dedicated talks.

My PhD thesis —funded by an FPU, 2014—obtained an "Outstanding Doctorate Award" (UGR 2022), and was ranked among the best three in astrophysics in Spain (SEA, 2019). I was also selected as a Lindau Nobel Laureate Meeting alumnus (2016) to participate in a meeting with 40 Nobel Laureates.

Internationalisation: Through my international post-doc roles and PhD, I have been working in Spain, Germany and Chile and have created a productive network, collaborating with experts worldwide. In 2022, I conducted a 2-month tour, visiting American and European institutions and giving 6 invited seminars (e.g. Carnegie observatory, OCA). In April 2024, I will carry out a tour to California, giving seminars at Caltech, UCLA, UCSC, and Berkeley.

Highlighted collaborations: 1) PI of a 98 hours VLT KMOS program to analyse Galactic centre stellar metallicities and kinematics. 2) Core-group member in a large JWST Galactic Centre community proposal. 3) The ALMA CMZ Exploration Survey, and 4) ERIS (VLT) collaboration, as an ERIS Fellow.

Independence and leadership: I have published 17 papers as leading author (3 single author), have received invitations to show my work in 6 international conferences and give 25 colloquia/seminars, and obtained prestigious fellowships (ESO (2022) and Humboldt (2020) fellowships). I was funded by the Max Planck Society and ESO to host students (~€15,000) for my projects. I am the PI of an accepted KMOS VLT program to survey the Galactic centre (98 hours), have been PI of another 6 VLT observing proposals (~85 hours), and co-I of 17 proposals at the VLT, GTC, and JWST. I am also a reviewer of high-impact journals (A&A, AJ, ApJ).

I was chosen as the chair of the IAU Galactic centre group. I contributed to organise four international conferences (4 LOCs, 1 SOC) and to the coordination of the ESO and MPIA Summer Internships. I have also given 17 credits ECTS (UGR). I am co-directing a PhD thesis, co-advising 2 PhD

students, and have (co-)supervised 7 master and 1 bachelor students. I led initiatives to communicate science results to the public (e.g. Astronomy on Tap, Heidelberg 2019).

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | GARIAZZO , STEFANO |
| **Referencia:** | RYC2023-044611-I |
| **Correo Electrónico:** | stefano.gariazzo@gmail.com |
| **Título:** | Looking for new physics through neutrinos and cosmology |

**Resumen de la Memoria:**

One of the most promising sectors of the standard model of particle physics where to look for new phenomena are neutrinos. These elusive particles have a mass that is much smaller than the one of any other known fermion. Their small mass differences, moreover, generate the extremely interesting phenomenon of neutrino oscillations, observed for more than twenty years. During my career I spent time in studying neutrino oscillations and neutrino masses under different perspectives: at terrestrial experiments, in connection with cosmology (to constrain the neutrino masses, to detect the relic neutrino background, to study new possible ways they may interact and their presence in the early universe), in the astrophysical environments and more. Anomalies in neutrino oscillation experiments, moreover, motivated theoretical physicists to propose the existence of a new type of neutrino, a sterile one, to which I also dedicated a significant part of my research activities. My publications on neutrinos, also thanks to several talks I gave at international events, are very well known in the community and attracted a high number of citations.

Another path to study new phenomena is through cosmology. Our universe is mainly composed of two unknown constituents: dark matter and dark energy. Analyses point towards a flat universe, an almost scale-invariant power spectrum of primordial fluctuations originated during inflation, and a dark energy component which can be simply described by means of a cosmological constant. Nevertheless, small tensions emerge when comparing different measurements for some observables, such as the Hubble parameter or the lensing in the Cosmic Microwave Background radiation. To better understand all these points, an important fraction of my research activity was devoted to increase our knowledge of the universe and investigate these small tensions: I studied dark matter, dark energy and a putative interaction between them, but also phenomenological models of inflation, the universe curvature, the reionization process. All these studies contributed to deepen the knowledge of different aspects of our universe, such as its composition and history.

All in all, I have developed a successful scientific career in theoretical astroparticle physics and cosmology, with particular attention to neutrinos, and I look forward to continue it in the incoming years.

**Resumen del Currículum Vitae:**

I finished my three-year doctoral studies in the University of Turin and I obtained my degree on 22/03/2016. With this thesis I won the Premio Nazionale "Sergio Fubini" 2016, awarded by INFN, as one of the three best PhD theses in theoretical physics discussed in Italy in the academic year 2015/2016. During the PhD I worked mainly on the phenomenology of a light sterile neutrino in cosmology, with a particular focus on CMB physics. The good knowledge of the employed numerical tools and of the theoretical cosmological framework allowed me to extend my research to other phenomenological models involving new particle physics beyond the Standard Model.

After the PhD, I moved as a post-doc at IFIC (CSIC-UV). I continued to work in cosmology and neutrino physics, with a particular interest in the relic neutrinos, their decoupling in the early universe and their clustering at late times. At the end of 2017 I joined the collaboration working on the PTOLEMY proposal for the direct detection of relic neutrinos, for which I have been responsible of the Physics case Working Group between July 2019 and June 2021.

I applied to the 2017 call for a Marie Sklodowska Curie Individual Fellowship, which I won with a proposal based on neutrino physics and neutrino cosmology. My two-year project started in April 2018 and was developed in Valencia, at IFIC, under the supervision of Dr Pastor, who was also my supervisor during my Juan de la Cierva - Incorporación (MICINN, Spain) contract, which I won in the 2018 call. Currently I am Marie Sklodowska Curie Fellow within the COFUND project Junior Leader by La Caixa Foundation at IFT, Madrid, after being fellow under COFUND project Fellini, by the Italian INFN.

I worked successfully within teams involving people from several research institutes in the world. In 2019, I spent three months as a visitor at RWTH Aachen (Germany). Between 2021 and 2023, I spent nine months as a visitor at Universidad Tecnica Federico Santa Maria, in Santiago de Chile. I have collaborated with more than 70 different researchers from institutions of 20 different countries. I attended many international conferences and workshops across the world, where I presented the results of my studies, having the possibility to discuss with many colleagues and develop new ideas and projects.

I am referee for several international journals, such as PRL, PRD, Nature, CPC, Universe, JINST, PLB, JCAP, MNRAS and expert evaluator for AEI (Spain) and EU projects.

I had the opportunity to be the official supervisor for one Master's student (between 2021 and 2022) and co-supervisor for three Master's degree students, who successfully obtained their degree between 2015 and 2020. One of them was awarded as the best thesis in Theoretical Physics discussed in Turin in 2015. In Valencia, I also contributed to the supervision of three PhD students.

In 2020 I obtained the Habilitation for professorship in Italian universities, sector 02/A2 (Theoretical Physics).

I am author or contributor to several web pages.

I am currently in charge for the cloud computation interface and the HTCondor pool of the Theoretical Particle Physics group in Turin.

I am developer for several public codes (FortEPiaNO, PArthENoPE and PhysBiblio).

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PIQUERO ZULAICA, IGNACIO |
| **Referencia:** | RYC2023-042940-I |
| **Correo Electrónico:** | ipiquerozulaica@gmail.com |
| **Título:** | Exploring the electronic properties of single-atom-thick molecular and graphene-based nanostructures on surfaces in UHV conditions |

**Resumen de la Memoria:**

My research focuses on the fundamental study of low-dimensional, quantum effects at surfaces and 2D-overlayers. For this, I correlate the atomic-scale structure and the electronic properties of interfacial 2D organic and inorganic nanostructures fabricated under UHV conditions. Particularly, I am expert in i) surface state confinement investigations by self-assembled single atom thick 2D (metal-)organic nanoporous networks, ii) exploration of the structural and electronic properties of these 2D (metal-)organic nanoporous networks and 1D metal-organic polymers, and iii) on-surface synthesis of (porous)-graphene nanoribbons and nanoporous graphene structures. These studies entail the use of state-of-the-art surface science techniques such as photoemission spectroscopies [e.g., angle-resolved photoemission spectroscopy (ARPES) and X-ray photoemission spectroscopy (XPS)], low-energy electron diffraction (LEED) and low-temperature scanning probe microscopies [e.g., scanning tunneling microscopy/spectroscopy (LT-STM/STS) and non-contact atomic force microscopy (NC-AFM)]. These studies are often complemented by visits to synchrotron facilities or external laboratories, where I often assume the PI role of the experiments. For such studies, I have established successful collaborations with international experimental and theoretical groups.

The relevance of my fundamental research performed during my PhD (2014-2018) can be inferred from my recent publication in Reviews of Modern Physics (I.F. 50.48), where upon editors' request, we provided a topic review on the field of surface state confinement. In parallel, in 2022 I was awarded the Extraordinary PhD Thesis Award by UPV-EHU. From this PhD time I contributed in the San Sebastian group with 9 articles in prestigious international scientific journals.

Since 2019, I am a long-term postdoc in the Physics of Surfaces and Interfaces group of Prof. Johannes V. Barth at the Technical University of Munich (TUM). Here, I have expanded my technical knowledge by complementing my ARPES, XPS and LEED expertise with scanning probe microscopy techniques such as LT-STM/STS and NC-AFM. In addition, I have established my own line of research at TUM and have initiated new collaborations with experimental groups and synthetic chemists that are beneficial for the group. Notably, I am PI of a 3-year DFG grant (300.000€). So far, in TUM I have already published 8 papers in high impact journals and 3 more are under review. In total, including extensive collaborative projects, I have published 28 peer-reviewed articles (12 in D1, 20 in Q1) with an average h-index of 13. Around 50% of these contributions are Open Access or are accessible through open online repositories.

In my 9 years of research, I have performed more than 12 temporary visits to scientific centers and synchrotron facilities and I have delivered 5 invited seminars and 8 contributions (5 oral + 3 poster) in national and international conferences. Two invited talks (one plenary) are scheduled for 2024. During my PhD, I was constantly involved in dissemination activities (e.g., students visiting the labs) and I was assistant lecturer for two years in the Physics course for Architecture students. At TUM, I am tutor of the advanced lab course on XPS and I have so far mentored (co-supervised) 1 Bachelor, 2 Master and 1 PhD student.

**Resumen del Currículum Vitae:**

I achieved fundamental advances in the research of single-atom-thick molecular and graphene-based nanostructures on surfaces in UHV conditions, paving the way towards full control over their electronic properties. Through a collaboration, I extended the electron plane wave expansion (EPWE) semiempirical model to predict the electronic properties of such 2D materials with unprecedented accuracy. This model requires inexpensive computational effort compared to DFT.

My main research lines are:

- Fundamental study of 2D electron gas confinement by atom-thick (metal-)organic nanoporous networks and 2D materials grown on surfaces.
- Study of the electronic bands of organic overlayers: 2D metal-organic frameworks (2D-MOFs), 1D metal-organic chains and (porous)-graphene nanoribbons.
- Recently, I initiated the exploration of 2D quantum materials in the form of 2D-MOFs, 2D materials and layered heterostructures. Emergent properties such as magnetism, superconductivity and quantum spin liquids will be unravelled.

* Education and scientific career in chronological order:
- 2006-2012. Mechanical Engineer degree.
- 2012-2013. One year Industry Internship at CAF.
- 2013-2014. Master in Nanoscience by the University of the Basque Country (UPV/EHU).
- 2014-2018. PhD degree in Physics entitled "Electronic Bands of Nanoporous Networks and One-Dimensional Covalent Polymers Assembled on Metal Surfaces". Supervisors Dr. J. Lobo-Checa and Prof. J.E. Ortega. Date of defense 30/11/2018 at UPV/EHU. Grade: "Cum laude". Extraordinary PhD Thesis Award in 2022.
- 2019- to date: Postdoc at the group of Prof. J. V. Barth at Tech. Univ. Munich.

* Experimental expertise in UHV techniques from common labs and synchrotron radiation facilities:
- Photoemission spectroscopies (ARPES, XPS).
- Local scanning probe techniques: LT- STM/STS, NC-AFM.
- Diffraction techniques (LEED).

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* Publications:
- 28 peer-review articles published in international scientific journals, 20 in Q1 and 12 in D1.
- 6 articles published in 2023, 2 in 2024.
- A seminal topical review in Reviews of Modern Physics (I.F. 50.48) in 2022.
- h-index = 13, cites over 380  (Google Scholar).

*Project record:
- PI of a DFG grant (300.000€, 2023-2026).
- PI of a synchrotron proposal at SLS (2020).
- PI of a granted ICYS postdoc grant (2019, turned down).
- In 2019, I was PI of ungranted Humboldt and MSCA fellowships (in 2019 and 2021).
- Participation as work team in 2 (European) projects during postdoc, 3 during PhD.

* Seminars and Conference contributions:
-  5 invited seminars and 8 contributions (5 oral and 3 posters) in national and international conferences.
- 2 invited talks (one plenary) scheduled for 2024.

* Dissemination activities:
- Host of lab visits of high-school students once a month (2016-2018).

* Stays and short visits to internationally recognized Research centers:
- 10 user visits to synchrotron facilities. PI of one (2020).
- 2 weeks at Prof. Ulrich Höfer's group (Univ. of Marburg, Germany) (May 2016).
- 3 months at Prof. S. Kawai' s group (MANA, Japan, Sept.-Oct. 2016).

* Teaching and supervision duties:
- Teaching assistant at UPV-EHU for two course years [Physics for Architecture students (2016-2018)].
- Tutor of the XPS advanced lab course (2020-2024).
- Supervisor of 2 Master, 1 Bachelor and 1 PhD TUM students.

* Awards:
- Extraordinary PhD Thesis Award 2022 (by UPV/EHU).

**Área Temática:** Ciencias físicas
**Nombre:** PERNA , MICHELE
**Referencia:** RYC2023-044853-I
**Correo Electrónico:** michele.perna@cab.inta-csic.es
**Título:** Probing the role of Active Galactic Nuclei and Starbursts on Galaxy Evolution during the JWST era and beyond

**Resumen de la Memoria:**

My research career is framed in the field of observational Astronomy. My main goal is to understand how galaxies form and evolve, with a particular interest in the role of Active Galactic Nuclei (AGN) and starbursts, and their feedback effects.

During my PhD at the University of Bologna (2013-2016), and my postdoctoral positions at the Arcetri Observatory (2017-2019), I gained in-depth knowledge of the physical and dynamical processes that regulate galaxy evolution, and I learned the state-of-art methods for processing multiwavelength data (from ultraviolet/optical to sub-mm/mm) coming from world-leading facilities. I obtained relevant results that have contributed to the advance in this field, for instance presenting the first clear evidence of regulatory ('feedback') effects of outflows in the distant Universe (z>1), and constraining important general properties of the ejected gas, then introduced in important cosmological simulations.

At the Astrobiology Centre (2019-present) I broadened my expertise by studying key systems like nearby starbursts, leading the science exploitation of VLT/MUSE data of 25 ULIRGs. I am also strongly involved in key projects carried out with the new generation of first-class telescopes, especially JWST (as part of the NIRSpec GTO team), VTL (within the ERIS GTO team) and ELT (within the HARMONI science team).

I currently dedicate most of my effort to different JWST programs, with a key position in some of them (e.g. leading the GA-NIFS survey, targeting 55 galaxies with 300 hours of telescope time). These programs are giving me the unique opportunity to participate in extragalactic surveys that are changing our understanding of galaxy evolution. My participation has resulted in over 20 publications in Q1 journals, comprising A&A, Nature, and Nature Astronomy (since 2023).

My work resulted in 69 refereed publications, with 3600+ citations and an H-index = 35 (according to NASA ADS). I led 12 first author refereed papers (and one submitted to Nature), with 410 citations, and I additionally contributed to 14 papers as second or third author.

The proposed research project aims to exploit unprecedented datasets to explore how AGN and starbursts affect galaxy evolution across cosmic time. This is possible thanks to the immediate access to the guaranteed observations of the forefront integral field instruments JWST/NIRSpec and VLT/ERIS, consisting of a sample of ~70 galaxies in the redshift range 1<z<9 (observed over the period 2022-2028). The unprecedented quality of these data will enable a transformational view of galaxy evolution. I will also contribute to the development of ELT science projects, using dedicated tools I developed for generating mock observations.

These projects are performed in the framework of broad international collaborations, involving major experts worldwide in the fields of galaxy evolution, and in the development of telescope instrumentation. All the skills so far gained, as well as the connections and the established international collaborations, are key to achieve the ambitious goals of the proposed project.

**Resumen del Currículum Vitae:**

In the area of observational Astronomy, my research focuses on the field of galaxy formation and evolution, with a particular interest on the role of Active Galactic Nuclei (AGN) and starbursts, and their feedback effects.

My work resulted in 69 refereed publications, with 3600+ citations and an H-index = 35 (according to NASA ADS). I led 12 first author refereed papers (and one submitted to Nature), with 410 citations, and I additionally contributed to 14 papers as second or third author. I have engaged in extensive dissemination activities, comprising 30+ oral presentations in international conferences, 12+ invited lectures/talks, several press releases and collaborations with media; I have also co-organized four workshops.

I have a leading role in several major projects targeting large samples of galaxies across the cosmic time. Among them, I co-lead the 'GA-NIFS' (Galaxy Assembly with NIRSpec IFS) survey, with 300 hours of JWST time; I also lead the exploitation of VLT/MUSE data of the 'PUMA' project, with 120 hours of MUSE and ALMA time; I am responsible of the data reduction of several JWST/NIRSpec IFS programs, and the ESO large program 'SUPER'. Moreover, I actively participate in other international projects, such as the JWST 'JADES' survey (800 hours of JWST time), the XMM-Newton large program 'SUBWAYS' (440 hours), and ELT/HARMONI (as a member of the science team).

I have been awarded funds totaling 1MEur (100 kEur as principal investigator), and telescope time exceeding 3000 hours as co-investigator on major telescopes (50+ hours as principal investigator, including optical, near-infrared, and X-ray facilities). Recognitions also include awarded post-doc positions at renowned institutions (e.g. Scuola Normale Superiore di Pisa), and several travel grants facilitating research collaborations in Europe (e.g. at ESO Garching) and the United States (at STScI). I currently supervise two PhD students (since 2023), and I have contributed to the training of five graduate and PhD students (since 2018).

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During my research career, I gained in depth knowledge on the processes that regulate galaxy evolution, and I made significant contributions in the study of the feedback effects of AGN and starbursts. I learned state-of-art methods for the treatment and analysis of multi-wavelength data coming from current world-leading telescopes (comprising ultraviolet, optical, near-infrared, and mm/sub-mm facilities). I also developed simulations to test the expected performance of near-future facilities (e.g. ELT/HARMONI).

I am strongly involved in the JWST project, as a member of the NIRSpec science team. This has given me the unique opportunity to participate in extragalactic surveys that are changing our understanding of galaxy evolution. My participation has resulted in over 20 publications since 2023. Among them, I highlight my first author paper submitted to Nature (currently under peer review) reporting the discovery of multiple AGN systems at z~3, which challenges prevailing theories of galaxy evolution.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | SOBCZYK , JOANNA |
| **Referencia:** | RYC2023-042789-I |
| **Correo Electrónico:** | jsobczyk@uni-mainz.de |
| **Título:** | Electroweak nuclear physics for future discoveries |

**Resumen de la Memoria:**

My research interests lie at the intersection of particle, nuclear and astrophysics. I earned my Master degrees in Computer Science and Theoretical Physics at the University of Warsaw (2009 and 2011). My Master thesis in physics was devoted to a strongly interacting electroweak sector of the Standard Model. Although the idea was captivating from the theoretical perspective, I was also attracted to the topics more directly connected with experiments. This brought me to the neutrino physics.

The main motivation for my work are long-baseline neutrino oscillation experiments. The success of these endeavours depends strongly on precise models for the neutrino-nucleus interaction at many scales. During my Ph.D. appointment, under the supervision of Prof. Juan Nieves (University of Valencia) my work was focused on intermediate energy neutrino interactions with nucleons and nuclei. I have been involved in theoretical work on hadron interactions, including rare processes like the strange or charm hyperons, kaon production or polarisation observables in weak processes.

After my Ph.D. appointment, I decided to expand my research towards ab initio nuclear physics, maintaining my original motivation. By joining the group of Prof. Sonia Bacca at the University of Mainz (2020), I initiated a new research line devoted to the study of lepton-nucleus scattering within an ab initio nuclear framework, the coupled cluster theory. My research plan was recognized and supported by two grants: Alexander von Humboldt and Marie Curie Postdoctoral Individual Fellowships. Until then the ab initio calculations for neutrino scattering were limited to light systems (up to 12C nucleus) using phenomenological nuclear potentials impeding a robust uncertainty quantification. Within our approach, nuclei important for neutrino experiments, 16O and 40Ar, are within the reach, and the calculations are performed using chiral nuclear potentials, opening way to assess uncertainty coming from the nuclear dynamics.

My work has a direct impact on the physics of future oscillation experiments such as DUNE or HyperK. I appreciate the fact that my research allows me to collaborate closely with experimental colleagues working in neutrino-nucleus interactions, through Monte Carlo event generators for neutrino oscillation experiments. The last few years in Mainz allowed me also to participate in devising a program of "electrons for neutrinos" at the MAMI facility, complementary to the Jefferson Lab "e4nu" effort.

I would like to develop a research program devoted to electroweak physics rooted in my current motivation, i.e. neutrino oscillation experiments, expanding it towards two directions. On the one hand, the study of nuclear response functions, which describe the behaviour of a nuclear state when interacting with an external probe, can be extended to low-energy electroweak processes involving nuclei at the Precision Frontier. This includes precise nuclear beta decays, CEvNS, as well as astrophysical searches at DUNE/HyperK. The ab initio nuclear approach allows for a robust uncertainty quantification which is a crucial feature in the new physics searches. An analogous approach can be used to model infinite nuclear matter allowing to study electroweak processes of astrophysical interest, such as neutrino interactions in neutron stars.

**Resumen del Currículum Vitae:**

I am the Marie Curie Postdoctoral Fellow at the University of Mainz (Germany). Previously, in 2021/22 I was the Alexander von Humboldt Fellow. I successfully applied for both scholarships (success rates ~10% and ~20% respectively) directly after starting my first postdoctoral appointment.
My research is focused on electroweak nuclear physics and its interface with particle physics. The main motivation for my work are long-baseline neutrino oscillation experiments. The success of these endeavors depends on precise models for the neutrino-nucleus interaction at many energy scales.
During my postdoctoral appointment, I launched a program which employs an ab initio nuclear technique to calculate the neutrino-nucleus cross-sections from first principles, i.e. using chiral nuclear forces rooted in QCD and solving a many-body problem with controllable approximations.
I combine my current lines of research with the expertise gathered during my Ph.D. at the University of Valencia where I was developing models of electroweak interactions of hadrons and nuclei. These calculations have been integrated into Monte Carlo event generators, making a direct impact on the oscillation studies.
I authored 22 refereed papers (15 as first or single author) in high impact journals (Phys. Rev. Lett., Phys. Rev. C, D, E, Phys. Lett. B). My work has been cited 240 times with h-index 11 (according to Inspire).

International collaborations and leadership
My scientific career has been developing in 3 countries (Poland, Spain, Germany). I have established various collaborations in Europe and USA. I was invited to present my results in 19 international workshops and conferences. I gave 11 seminars at Physics Departments. Since Sept 2023 I am a board member of NuSTEC (Neutrino Scattering Theory Experiment Collaboration).
In the past 2 years I was involved in organization of 2 workshops and "European Conference on Few-Body Problems in Physics". Currently, I am a convener of NuInt2024. Moreover, I have successfully applied to INT (Seattle) and MITP (Mainz) institutes to organize a scientific program and a workshop respectively. Both events are scheduled in 2024/2026.

External funding

I successfully applied to various institutions to fund my research. Apart from the Marie Curie and Alexander von Humboldt, I secured fundings through the Joliot-Curie Program (PRISMA+ Cluster of Excellence, Mainz). I am a work team member of a Spanish national research project (PI J. Nieves, IFIC, Valencia).
Recently, I submitted 2 proposals to German Research Foundation: an individual grant "Emmy Noether" (for junior professors). I am also one of PIs of the proposed Collaborative Research Center 1660. Both applications are under evaluation.

Teaching and mentoring
I have teaching experience both at graduate and undergraduate level. I was a teacher assistant in Poland. I was a substituting lecturer for Quantum Mechanics in 2022. In the last 2 years I have given the Nuclear Theory course at the graduate level. I also gave classes during summer schools. I co-supervised a B.Sc. thesis in 2022, a M.Sc. thesis in 2023 and currently I am co-supervising a M.Sc. student.

Diversity & Outreach
I serve as an Equal Opportunity Officer at Univ. of Mainz. I organized leadership workshops and mentoring programs for students. In April 2024 I will participate in @FlipPhysics conference (Valencia).

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | CHAITOGLOU CHAITOGLOU, STEFANOS |
| **Referencia:** | RYC2023-043365-I |
| **Correo Electrónico:** | schaitog@gmail.com |
| **Título:** | Forefront research on exploration of novel nanomaterialss |

**Resumen de la Memoria:**

I defended a thesis on investigations regarding the chemical vapor deposition of graphene films for application in nanoelectronics and supercapacitors. After completing my PhD studies in UB (ES), I moved for a post doc in NCSR Demokritos (Gr), upon acquiring a competitive fellowship for industrial research, co-financed by Adamant Composited Ltd. I stayed there for 4 years (2017-2021). Thanks to this fellowship I started my research on graphene/transition metal carbides hybrid compounds for application in electrocatalysis. During my time there, apart from developing the above research line, I participated as a researcher in various projects funded by the European Comission (1 ERC PoC, 2 Horizon 2020, 1 FLAG-ERA), in application of 2-dimensional and ultrathin films in nanoelectronics and energy harvesting and storage. Two of these projects were related to studies of ferroelectric hafnia films for application in non-volatile memories. In 2021 I returned in the Department of Applied Physics of University of Barcelona as a post-doctoral researcher, after receiving a MSCA-COFUND Beatriu de Pinos Fellowship from Generalitat de Catalunya, to investigate transition metal carbides/ vertical graphene electrodes for H2 production. In September of 2023, I renounced the BP fellowship to start a MSCA IF for the 2023-2025 period, to work in the same department in preparation of graphene nanostructured electrodes via laser irradiation for electrocatalytic H2 production. In total, I have raised ~542,900 € as PI of research projects and competitive fellowships. In 2023, I received the R3 certificate from the Spanish investigation state agency, which recognizes me as ' ' an established and independent researcher according to the European classification' ' . During the implementation of the RyC fellowship, I aspire to start a research line on the studies of ferroelectric (FE) materials boosting the electrocatalytic water splitting. Thanks to my previous training and by merging my expertise in the above topics, I am placed in a position to tackle the challenges that can arise during the implementation of such an interdisciplinary project. In concrete, I want to study the efficiency of FE hafnia films and hafnia-based heterostructures towards hydrogen evolution. Electric spontaneous polarization resulting from asymmetric structures can play a significant role during the hydrogen and oxygen evolution reactions. This is because the chemical interaction between reactants and catalysts can be modulated by the catalyst's polarization. Ferroelectrics, owing to their reversible polarization, hold promise in providing an excellent platform for mediating the adsorption strength of reaction adsorbate. The scientific impact is not restricted to electrocatalysis but extends to fields that are associated with ferroelectricity at the nanoscale, a particularly active field that could open the route to new technologies in electronics and energy harvesting and storage. As already stated above, recent evidence suggests that ultrathin $HfO_2$-based materials show enhanced ferroelectricity due to reduced dimensionality. Unveiling the mechanism of enhanced ferroelectricity of HZO at nanoscale could be a significant scientific breakthrough. Ultimetaly, We will try to answer fundamental scientific questions which are associated with the presence of ferroelectricity in conductive oxides

**Resumen del Currículum Vitae:**

1. Scientific contributions:

My expertise stands on the chemical vapor deposition synthesis of 2-dimensional thin films, magnetron sputtering, Raman spectroscopy, Scanning electron microscopy as well as in the design and development of devices (electrolytic cells, field effect transistors by photolithography and e-beam lithography). Lately, my main research activity is focused on the development of hybrid nanocompounds on graphene supports for application in electrocatalytic hydrogen evolution.

Some major contributions have been my articles on the CVD synthesis of Mo2C/graphene vertical heterostructures on liquid catalysts as well as those regarding the studies of ferroelectric hafnia films. More recently, my works on the preparation of Mo2C on vertical graphene supports stand out.

I have published 35 articles in peer-reviewed journals, almost all of them in 1st quartile journals (15 as first author/corresp. author) and present my work in ~40 international conferences. My research articles have received ~ 600 citations and I hold an h-index 16. I occasionally present my work in industrial forums and outreach activities dstinated to the general public.

2. Societal contributions:

I have presented two patents on technologies and products which have emerged from my research activities. One related to low power consumption field effect transistors based on graphene gate and one related to advanced nanostructured electrodes based on carbon nanotubes for energy storage. I often disseminate my research to activities oriented for the general public, like those taking place in the European research night, and on industrial forums.

3. Contribution to young researcher training:

I have directed and co-supervised 10 thesis of Master and Bachelor students in degrees of physics and nanoscience. At present, I am official co-Director of 2 PhD thesis in the Dept. of Applied Physics of UB. Moreover, I supervise the work of one post doc who has been contracted for a national grant where I am the co-PI+ two master students. During the last 3 years in UB, I teach laboratory courses in undergraduate and post-graduate level (electromagnetic technology, clean room processes, synthesis of nanomaterials, micro and nano technology). Finally, I have served as secretary member in PhD defense committees and as external evaluator of research proposals for the Universidad Tecnológica Metropolitana in Chile. I have served as advisory panel member of Nanotechnology (IOP, 2017-2018). At present, I am topical board editor of Catalysts (MDPI).

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Ciencias físicas
**Nombre:** LUQUE RAMIREZ, RAFAEL
**Referencia:** RYC2023-044426-I
**Correo Electrónico:** rluque@uchicago.edu
**Título:** Understanding the origin and nature of small exoplanets

### Resumen de la Memoria:

Dr. Rafael Luque is a developing leader, seasoned observer, and educator in the field of exoplanets. His research aims to understand the origin and nature of planets smaller than Neptune. Luque's expertise comprises the following techniques: precision radial velocities using high-resolution spectrographs in ground-based telescopes, transit photometry from ground- and space-based instruments, and transmission, emission, and reflection spectroscopy of exoplanet atmospheres using low- and high-resolution spectrographs from space and ground, respectively. Despite his short professional career, Luque's contributions have already had a measurable impact, including the discovery and characterization of more than 200 planets (16% as corresponding author) and the publication of 126 articles (15% as lead or co-lead author) in Q1 journals.

Among the most relevant scientific and technical contributions of his work are: i) significantly increasing the number of known transiting exoplanets with measured densities by combining the transit and radial velocity techniques, ii) the discovery and characterization of benchmark targets for atmospheric characterization with JWST and Ariel, and iii) the resurgence of the "water world" hypothesis to explain the origin and nature of sub-Neptune-sized planets. In addition, Luque is actively contributing to the topics of star-planet interactions due to magnetic fields and atmospheric characterization using high- and low-resolution spectrographs.

Some of the highlights of his research are the following. First, Luque has contributed to nearly 50% (77) of all (158) planets smaller than Neptune with measured masses and radii that have been discovered since 2018 (first year of PhD). Second, from the list of all exoplanets smaller than Neptune that JWST will observe before the start of Cycle 3, Luque has discovered or measured the mass of 55% of them. Third, Luque has led the discovery of the third (GJ 357 b) and fourth (HD 260655 bc) closest transiting planets to the Sun. Another remarkable exoplanet discovery led by Luque is HD 110067. This system, published in Nature, comprises six transiting sub-Neptunes orbiting a nearby solar-type star in a rare resonant chain configuration, making it a "Rosetta Stone" for orbital dynamics, planet formation, evolution, and atmospheric studies. Fourth, confirming the existence of a new type of planet absent in the solar system known as "water worlds", going against the established interpretation of the origin of the infamous "radius gap". Luque's work is highly cited (h-index 29) and has sparked numerous follow-up and counter-argument studies in observational and theoretical fields.

Finally, Luque has obtained more than 6000 hours of competitive telescope time (in JWST, Keck, GTC, Gemini, VLT, ESO3.6m, TNG, CAHA3.5m, among others), over 300K in competitive project funding, and 250K in individual fellowships and awards to carry out his research. In addition, he is a consortium member of the MuSCAT2, CARMENES, and MAROON-X instruments, an active contributor to NASA's TESS and ESA's CHEOPS missions, and an elected member of the Steering Committee of the KESPRINT international collaboration. Luque's first-author papers include collaborations with over 150 researchers from 50 different institutions across 15 countries.

### Resumen del Currículum Vitae:

In January 2018, Luque started his PhD at the IAC by obtaining one of the competitive INPhINIT grants from "la Caixa" Foundation and EU's H2020 MSCA. Under the supervision of Prof. Enric Pallé and Dr. Grzegorz Nowak, Luque defended his PhD in June 2021 as a thesis compendium of 6 first-author papers. The thesis received the highest honors and has been awarded two "Best PhD thesis in Astronomy" prizes by the University of La Laguna and SEA, and the honorary mention in the "2021 PhD Prize" of the IAU. During his PhD, Luque co-supervised two MSc theses and did a four-month stay at the MPIA in Germany.

After his PhD, Luque joined briefly Dr. Pedro Amado's group at the IAA-CSIC as a postdoc. During this stay, he published a seminal article on the demographic properties of small exoplanets and broadened his research interests to instrumentation and star-planet magnetic interactions. On the latter, Luque is co-supervising a PhD student (Mr. Daniel Revilla, UGR, 2022-) with Dr. Amado. Nowadays, he maintains a strong connection with the group as Doctor Vinculado of the PID2022 project.

In March 2022, Luque moved to UChicago to work with Prof. Jacob Bean using a Margarita Salas fellowship from the Spanish Ministry of Universities to increase his knowledge of exoplanet atmospheres. At UChicago, Luque is leading several projects, including state-of-the-art observations with JWST funded by STScI and a large Key Strategic Mission Support program funded by NASA HQ. Meanwhile, Luque is co-supervising another PhD student (Mr. Ritvik Basant, UChicago, 2023-) and leading an outreach program to engage with the senior community in the Chicagoland area. These contributions as a postdoc at UChicago have been recognized with the Suzuki Postdoctoral Fellowship Award.

Over the past 6 years, Luque has published 11 articles as lead author, 8 more as co-lead (2nd/3rd author), and a total of 126 in Q1 journals (h-index 29). First-author publications include Nature (1), Science (1), A&A (8), and RNAAS (1), and account for 300+ citations, 29.7 avg. citations and 8.4K total reads. Four of the
11 first-author papers have been accompanied by international press releases led by NASA/ESA and 85% of all publications are in the top 25% of most cited publications worldwide (according to SciVal). To date, Luque has given more than 30 international talks (20 invited), regularly serves in funding review panels (NASA ROSES' EPRV and XRP), time allocation committees (ESO, Gemini, Keck), and as a journal referee (Nature, MNRAS, AJ, ApJ, A&A, PSJ). Currently, he is organizing an international meeting dubbed "Density Matters 2024" and a symposium in the upcoming XVI RC SEA 2024.

Finally, Luque has a long trajectory in outreach outside of academia. He has built, with the help of private associates, an amateur observatory fully devoted to astronomy education in Gorafe (Spain). The project is the culmination of more than a decade of work in the rural areas of Andalusia doing hundreds of publicly open astronomical observations and consultancy for local governments and entrepreneurs in astro-tourism. Luque has been recognized as "Starlight Ambassador" by the Starlight Foundation in 2015, "Honorary Citizen of the Year" by the city council of Priego de Cordoba in 2020, and "Distinguished Young Citizen" by the Rural Development Group of the Subbeticas National Park in 2021 for this work.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | CRUZ MARTÍNEZ, JUAN MANUEL |
| **Referencia:** | RYC2023-043794-I |
| **Correo Electrónico:** | juacrumar@gmail.com |
| **Título:** | AccHEP: Accurate and Accelerated High Energy Physics |

**Resumen de la Memoria:**

My research lies in the interface between High Energy Physics (HEP) and High Performance Computing (HPC), two fields historically entangled. I have worked on both the theoretical and technical aspects of fixed order calculations and the determination of Parton Distribution Functions (PDFs). Some highlight of my work are the release of the NNPDF4.0 family of Parton Distribution Functions, the MadFlow, PDFFlow and VegasFlow software package for hardware acceleration and the application of a quantum machine learning algorithm to the real physical problem of PDF fitting.

In the PDF side, I am part of the NNPDF collaboration, where I investigate the application of machine learning techniques to the analysis of the large amounts of data to release some of the most precise PDFs available (nominal uncertainties of the order of a %). In the last few years, we have published NNPDF4.0 (of which I'm the main author of the code) and their extensions with photon-initiated contributions, theoretical uncertainties and approximated N3LO. This work has led to the first evidence of an intrinsic charm component within the proton. Within the collaboration I coordinate the research and development of novel techniques and algorithms required to advance our knowledge of the internal structure of the proton.

In the fixed order side, I have worked on producing some of the most accurate predictions for Higgs production processes (in the ggF and VBF channels) and on improving the computational cost of these highly complex calculation. We have released the first NLO calculation fully running on a GPU as well as a vectorized PDF interpolation tool. In addition, we have proposed several algorithms that could pose an advantage when executed in a quantum computer.

In the coming years, as part of the NNPDF collaboration, I will focus on improving the accuracy of PDF determination by integrating the latest research in fixed order calculations and the latest experimental data. Going beyond the state-of-the-art in preparation for the LHC Run III data and future colliders.

I will address the challenge of the computational cost of NNLO and N3LO calculations by extending the current frameworks for hardware acceleration and making them available for the wider community. Exploiting the new possibilities and algorithms made possible by the usage of Graphical Processing Units (GPUs) and Quantum Computers.

**Resumen del Currículum Vitae:**

I am a theoretical particle physicist. My main contributions are in the fields of Parton Distribution Functions, fixed order calculations, and numerical and technical improvements. I did my PhD in the Institute of Particle Physics Phenomenology in Durham (UK) under the supervision of Prof. N. Glover. Next I held a 4-years postdoc at the University of Milan (Italy) with Prof. S. Forte and I am currently a Senior Fellow at the CERN Theory Group. My work has led to more than 20 papers and 15 invited talks.

During my PhD I did secondments in the University of Zurich and the Projects & Technology branch of Shell where I gained invaluable industry experience. I have been an organised for 3 editions of the Young Theorist Forums in Durham and a seminar organiser in both Milan and CERN.

I gained teaching experience as an assistant for Quantum Physics I & II and Informatics at the University of Milan where I supervised several master and undergraduate students and I have been the tutor for the Machine Learning tutorials at the AIHEP School at COMO in 2023.

Since 2019 I'm part of the NNPDF collaboration, the most prolific PDF fitting group at the forefront of the knowledge of the internal structure of the proton, in which, as the person in charge of R&D, I coordinate the technical developments leading to state-of-the-art research. The PDFs released by the NNPDF collaboration are widely used and the default choice in tools like Madgraph or Pythia.

My expertise spans a highly relevant range of topic. I have worked on fixed order calculations (NNLO QCD contribution for Higgs production processes, VBF and ggH), on PDF determination (analyzing data from e.g., LHC or Hera with machine learning techniques), and integrating new technologies in current research (I've published papers on hardware accelerators for Monte Carlo event generators and on quantum machine learning algorithms). I maintain open-source code repositories of academic software and have participated in associated training for early stage researchers.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | GONZÁLEZ CUADRA, DANIEL |
| **Referencia:** | RYC2023-044201-I |
| **Correo Electrónico:** | danielgc25@gmail.com |
| **Título:** | Daniel_Gonzalez_RyC |

**Resumen de la Memoria:**

My research focuses on the study of quantum many-body phenomena using quantum technologies, with applications ranging from condensed matter to particle physics. The former include quantum simulators and quantum computers, mainly based on atomic systems, as well as quantum-inspired classical simulation methods, specifically tensor networks. To address this multi-disciplinary problem, I consider a holistic approach where quantum hardware and software are co-designed to efficiently target particular problems, with the goal of obtaining a practical quantum advantage using near-term devices. I carried out my research at the Max Planck Institute for Quantum Optics in Munich, the Institute of Photonic Sciences in Barcelona and the Institute for Quantum Information and Quantum Optics in Innsbruck, where I did my master thesis, PhD thesis, and I'm currently working as a postdoctoral researcher, respectively. My two main research lines are the following.

My first research line focuses on analog quantum simulators, based in particular on ultracold atoms in optical lattices, to experimentally prepare and investigate strongly-correlated phases of matter. I have focused on two different sets of models, those giving rise to strongly-correlated topological phases, relevant for condensed-matter physics, as well as lattice gauge theories (LGT), relevant for high-energy physics. In the first case, I showed how ultracold atomic mixtures allow to control and measure topological phenomena beyond the possibilities offered by traditional solid-state experiments, including symmetry-broken topological phases or fractionalization induced by topological defects. Moreover, I uncover novel topological phenomena that emerge in this platforms in the presence of dipolar or cavity-mediated interactions, including higher-order topological quantum paramagnets or 2D Peierls transitions. In the second case, I showed how current atomic platforms can be harnessed to investigate low-dimensional particle physics phenomena, including confinement-deconfinement transitions between fractionally-charged quasiparticles or chiral symmetry breaking. Moreover, I use tools from quantum information to characterize the topological structure and the non-equilibrium dynamics of LGT. Currently, I am developing quantum simulation protocols to study the non-equilibrium dynamics of 2D LGT using Rydberg atom arrays.

My second research line involves digital quantum simulation using gate-based quantum computers, with a strong focus on lattice gauge theories. Also in this case, I am interested on the one hand in developing quantum hardware that is tailored to the specific problem, and I have proposed in this direction a Rydberg-based qudit quantum computer and a fermionic quantum processor co-designed to target non-abelian gauge theories and fermionic models, respectively, more efficiently than previous qubit-based approaches. On the other hand, I developed quantum algorithms that make an efficient use of the hardware resources, and that allow e.g. to systematically truncate, encode and evolve infinite-dimensional non-abelian gauge fields, as well as tensor-network classical benchmark algorithms. Currently, I am investigating hardware-efficient variational algorithms to run in the proposed hardware in the near term, as well as tailored error correction protocols for longer-term applications.

**Resumen del Currículum Vitae:**

My research lies at the interface between quantum information, atomic physics, condensed-matter and high-energy physics. My aim is to develop quantum simulators based on atomic systems, with the goal of investigating quantum many-body phenomena beyond the capabilities of classical computers. My work has led to 2 preprints and 23 publications in high-impact journals (12 as a first author, 2 as a last author), together with 50 collaborators (excluding reviews) from 11 countries. I disseminated my results in 30 talks in international conferences and seminars, including 7 invited talks in 2023. Finally, I regularly referee articles for different journals, and engage in outreach activities.

After a master thesis supervised by Prof. Cirac at the Max Planck institute for Quantum Optics in Munich (12 months), I completed a PhD at the Institute of Photonic Sciences (ICFO) in Barcelona under the supervision of Prof. Lewenstein, supported by a Marie-Curie-COFUND fellowship. During my studies, I proposed experimental realizations of different strongly-correlated phenomena, relevant both in solid-state and particle physics, using analog quantum simulators based on ultracold atoms, including quark confinement, topological order or phonon-induced phase transitions. My PhD thesis, resulted from collaborations with international theory and experimental groups, led to 9 publications (7 as a first author), and was recognized with the ICFO PhD award and the UPC extraordinary PhD thesis award. During my studies I co-supervised two summer students, leading in one case to a joint publication.

After my PhD, I continued working for 8 months at ICFO as a Postdoctoral Researcher. During that time, I worked with 5 different PhD students, leading each project to a publication (1 as a last author without my PhD advisor), by providing new ideas that originated in and extended my doctoral thesis, with a focus on dipolar atomic systems. Moreover, I published a single-author paper and a review on analog quantum simulation for LGT together with leading researchers in the field.

I then joined the group of Prof. Zoller at the Institute of Quantum Information and Quantum Optics in Innsbruck, where I worked for 2 years as a Simons Postdoctoral Fellow, and now as a Senior Postdoctoral Researcher (28 months so far). In Innsbruck, I extended my research towards quantum computation. Specifically, I developed qudit architectures and fermionic processors based on Rydberg atom arrays and co-designed hardware-efficient quantum simulation protocols tailored to quantum chemistry and high-energy physics problems. I carried out this research in collaboration with leading experimental groups in the US, as part of the Simons Collaboration on Ultra Quantum Matter.

My recent work has focused on novel formulations and quantum algorithms to digitally simulate non-abelian gauge theories. I also worked on higher-order topological phases in atom-cavity systems, leading to my second last-author paper. Recently, I wrote a review article on quantum computing for

LGT with researchers at CERN, IBM and DESY. Finally, in 2023 I started the full official supervision of 2 PhD students, one together with Alejandro Bermudez in Madrid and another with Hannes Pichler in Innsbruck, working on projects I proposed related with my postdoctoral research.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | CARBALLO  RUBIO, RAÚL |
| **Referencia:** | RYC2023-045894-I |
| **Correo Electrónico:** | raul.carballorubio@gmail.com |
| **Título:** | Towards a new paradigm of black hole physics |

**Resumen de la Memoria:**

My interests lie at the intersection between gravitation and quantum mechanics. The difficulties of reconciling these two theoretical frameworks has been known for decades, and finding a theory of quantum gravity is a sort of holy grail of theoretical physics. Quantum gravity is expected to be important in situations in which gravitational fields become extremely strong, which we only expect to happen in the early universe and inside black holes. In my opinion, recent observational developments make black holes the most promising systems to probe quantum gravity. These developments started with the recent detection of the gravitational waves generated in a merger of black holes. Since then, electromagnetic waves (in the infrared and radio bands) have also been used to obtain the most detailed "photographs" of two supermassive black holes up to date. The driving force behind my research can be encapsulated in two questions: (1) What is the structure of black holes in quantum gravity?; (2) Can we observe any imprints of this quantum structure? These questions require the development of theoretical frameworks that allow us to construct better models of black holes. Also, these questions require the effort of connecting these theoretical frameworks with observations. I work along these two lines of research.

**Resumen del Currículum Vitae:**

I have a total of 4 postdoctoral positions at prestigious research centers and universities. My research has been featured in well-known media outlets such as Scientific American and Sky&Telescope. I am participating in the international collaboration Next Generation Event Horizon Telescope (ngEHT), specifically I am part of the Fundamental Physics Science Working Group, co-leading (with Surgeet Rajandran of the Johns Hopkins University, U.S.A.) the "Quantifying Horizon Physics" topic (since September 2021). I have a total of 52 peer reviewed papers (two of them as single author), 1 book chapter, 3 preprints undergoing peer review and 6 conference proceedings, with an h-index of 23 according to INSPIRE-HEP. I have been invited to give plenary talks in 9 different international and national conferences and I have a total of 22 contributed talks. I have officially supervised 3 PhD students and 3 Master theses. I have been invited to more than 20 seminars at recognized international institutions. I have received three Honorable Mentions in the GRF Awards for Essays on Gravitation (2014 and 2015). I obtained the third prize of the National Award for Excellence in Academic Performance (2014) and the Extraordinary Degree Prize at the University Complutense of Madrid (2012).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | TORRADO CACHO, JESÚS |
| **Referencia:** | RYC2023-045660-I |
| **Correo Electrónico:** | jesus.torrado@posteo.de |
| **Título:** | Ensuring the future of Cosmological inference in the era of Big Data surveys. |

**Resumen de la Memoria:**

In this project, I will work to ensure that the Cosmology and Particle Physics community will continue to able to perform inference, efficiently and robustly, on physical models of ever-growing complexity using the data from future cosmological surveys requiring statistical modelling of growing complexity. My project involves the following three interconnected lines of research: two cosmology-focused general inference developments, and an application to Cosmology with the LISA GW interferometer.

The first line of research of the project focuses on increasing the efficency of MCMC methods by taking advantage of the differentiability, if present, of the inference pipeline. Since the part of this pipelines that deals with Cosmology and Particle Physics calculations is rarely differentiable, I will develop a hybrid MCMC-HamiltonianMC algorithm that will selectively exploit differentiability, taking advantage of Cobaya's precise knowledge of the structure of inference pipelines. Also in this part of the project I will enable Cobaya to perform inference in hierarchical models via reversible MCMC, as a tool to e.g. constrain population models or extract template-free reconstructions of Cosmological observables.

The second line of research of the project focuses on retaining the ability to perform inference when inference pipelines become too expensive for traditional Monte Carlo methods. It starts from previous work on a machine-learning inference framework based on Gaussian Process that can reduce the number of posterior evaluations by a factor of a hundred. The core of the project consists on alleviating performance degradation of this approach with increasing dimensionality, both introducing approximate Gaussian Process methodologies and reducing the problem dimensionality by modelling nuisance-marginalised posteriors. I will also explore the use of Normalising Flows to improve the robustness of the algorithm.

The third line of research of the project focuses on ensuring the robust extraction of cosmological information from the future LISA GW interferometer. To do this, the methods developed in the other two lines of research will be applied into the (mock) full inference pipeline of LISA, in order to characterise and subtract astrophysical and noise components, and produce a reconstruction of the residual stochastic gravitational wave background that can hopefully be tested against Cosmological and Particle Physics models for such a background (inflation, cosmic strings, first-order phase transitions...).

**Resumen del Currículum Vitae:**

Scientific contributions

   1. Co-lead efforts to detect and characterize cosmological-origin SGWB with LISA: non-parametric reconstruction pipeline SGWBinner, and characterization of LIGO/Virgo-consistent stellar-mass black hole binaries with LISA. Within this projects, I have lead the statistical inference and population synthesis aspects. Featured in the LISA Cosmology White Paper and Red Book; presented at international conferences (LISA Symposium 14, Cosmology From Home 2022) and various seminars.

   2. Developed Cobaya, a next-generation cosmological inference framework focused on integrating complex model-data pipelines for large surveys (currently used by Euclid, Simons Observatory, DES, LISA), and rapid prototyping for small-scale projects. I regularly consult on Cobaya and applications, including for Euclid's likelihood implementation. Cobaya is becoming one of the most used inference frameworks in Cosmology, with more then 250 citations to date. It has been presented at invited seminars internationally (Imperial College London, Jet Propulsion Laboratory, LSST DESC Theory & Joint Probes seminar series...).

   3. Co-developed of GPry, a robust machine-learning Bayesian inference code, based on Gaussian Processes. GPry enables inference on previously intractable problems by reducing the number of posterior evaluations to 1/100th's of the amount that traditional Monte Carlo methods need. This line of research is under heavy development, and has applications across a range of cosmological and general problems, allowing for inference on computationally-heavy cosmological observables, e.g. those involving matter distribution at non-linear scales.

Contributions to society

   1. Cobaya and GPry tackle Bayesian inference in general terms and with innovative developments, and have direct industrial applications. Their source code is publicly available and they are liberally licensed with L-GPL, which allows businesses to integrate them in their data pipelines.

   2. Outreach activities: BBC Stargazing Live event at Sussex in 2016, and the RWTH Aachen TTK Outreach Periscope broadcast in 2018-19.

Contributions to the training and mentoring of young researchers

   1. I have participated in the supervision of one B.Sc. student and 5 M.Sc. students, for two of which I was a lead supervisor. In addition, I regularly collaborate in Ph.D. students' projects (R.J. Hardwick at ICG Portsmouth, G. Cañas Herrera at U. Leiden, Chloe Gowling at U. Sussex, J. el Gammal at U. Stavanger, S. Günther at RWTH Aachen, Paolo Marcoccia at U. Stavanger), whom I try to mentor by introducing them to literature and computational techniques that are relevant for their line of research. One of these students, G. Cañas-Herrera, is currently one of the lead developers of the Euclid likelihood code, applying research that I mentored during her Ph.D.

   2. I actively mentor younger researchers and colleagues on theoretical and practical aspects of Bayesian inference. I do that by imparting graduate-level student workshops (INFN Padova and Université Libre de Bruxelles, 8h each), and via the Cobaya user-feedback channels (CosmoCoffee forum, GitHub issues and email/conference).

Other relevant contributions

1. Local and scientific organizing committee for UK Cosmo and South Coast Cosmology at U. Sussex, and for international conference Cosmo'19 at RWTH Aachen.

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | PUEBLA ANTUNES, RICARDO |
| **Referencia:** | RYC2023-044095-I |
| **Correo Electrónico:** | rpueblaantunes@gmail.com |
| **Título:** | Quantum Science and Technology |

**Resumen de la Memoria:**

Research trajectory:

I started my research career at the MSc level, when I published my first article. During the PhD, supervised by Prof. Martin B. Plenio, I published 8 high-impact articles and realized an outstanding PhD thesis as awarded by Springer. One of my publications coined a novel phenomenon in the realm of quantum phase transitions, which has received over 350 citations. After the PhD, I joined the group led by Prof. Mauro Paternostro where I learned first hand quantum thermodynamics from one of the founders of the field, as well as gained expertise in other areas such as quantum information and quantum control. In 2021 I joined the group led by Prof. J.-J. García-Ripoll where I worked under the EU-funded project SuperQuLAN in collaboration with top-notch scientists (e.g. A. Wallraff and P. Rabl) in the development of protocols for distributed quantum computation. In June 2022 I moved to the UC3M as Profesor Visitante, but kept my active and growing network of international collaborators, including well-established and world-renowned researchers in quantum science and technology. During these years, I have worked with leaders in distinct fields of quantum science, allowing me to gain a unique and high-quality research profile.

Lines of research:

I propose to continue these two lines of research where I have proven expertise:

A. Quantum control for sensing and information protocols
The main goal consists in employing state-of-the-art quantum control, numerical and statistical inference techniques to the areas of quantum sensing & metrology, aiming at pushing the boundaries of the realm of application of quantum technologies. On the quantum information side, we find that distributed quantum computers are attracting a growing attention. Yet, quantum control techniques are required to unleash their full potential, such as the design of protocols to generate genuine multipartite entanglement across a quantum network or sophisticated quantum state transfer schemes to improve bidirectional quantum communication --topics that will be pursued in collaboration with previous collaborators at ETH Zurich, where they experimentally test them.

B. Out-of-equilibrium quantum dynamics and critical phenomena
The main goal of this research line consists in investigating universal behavior of quantum systems when quenched out of equilibrium. I will focus both on finite-component and spatially-extended systems, as embodied by the quantum Rabi model and the paradigmatic Ising model in a transverse field, but will be extended to other and richer models. These systems will be used as a testbed to merge and establish a very-needed bridge between quantum metrology and quantum thermodynamics with quantum critical and many-body systems. In addition, collaboration with experimental groups will also play a key role in this research line.

In summary, my unique research profile focuses on the burgeoning field of quantum technologies with proven expertise in distinct aspects of quantum science (such as quantum information processing, quantum sensing and metrology, quantum critical phenomena, quantum control) combined with a deep knowledge in three of the leading quantum platforms, namely, superconducting qubits, trapped ions and nitrogen-vacancy centers, and an active and excellent network of international research

**Resumen del Currículum Vitae:**

Positions:
- Since June 2022: Profesor Visitante in Universidad Carlos III de Madrid (Spain).
- January 2021/ June 2022: Senior Postdoc at IFF-CSIC (Spain) working on the EU-funded project SuperQuLAN, in the group led by Prof. J.-J. García-Ripoll.
- January 2018 / December 2020: Postdoc at Queen's University Belfast (UK) in the group led by Prof. Mauro Paternostro.
- PhD obtained on 13/03/2018 with high honors in the Ulm University (Germany) under the supervision of Prof. Martin B. Plenio. PhD thesis received the Springer Thesis Prize recognizing outstanding research.


Teaching:
- Quantum Technologies, Physics I, Physics Lab for BSc at UC3M (Spain). Mathematical methods for quantum information at the MSc level in QUB (UK). Electrodynamics for BSc in Ulm University (Germany).


Mentoring and Supervision:
- Currently co-supervising the PhD thesis of G. F. Penas on quantum links and state transfer.
- 3 MSc thesis in the years 2022&2023 in the Theoretical Phyiscs MSc of UCM (Spain).
- 1 BSc thesis (TFG) in year 2023 in the BSc Engineering Physics of UC3M (Spain).

Publications:
I have 35 published articles: 20 of them first authored, 1 single-author article, and 4 as last author., including many high-impact journals, some being selected as Editor's Suggestion (4 Phys. Rev. Lett., 1 npj Quantum Information, 14 Phys. Rev. A, B, E and Applied, 3 Quantum Sci. Technol., 2 Commun. Phys., etc.). In addition, I have 8 pre-prints already submitted. I have received more than 1200 citations, and a h-index of 17 (Google Scholar), which signals the influence and quality of my research.
The large number of first-authored and last-authored articles demonstrates the leadership and independence in my research, my strong capabilities to develop novel and interesting ideas, and communication skills. It also demonstrates that I can perform high-quality and high-impact research alone or coordinating efforts with international researchers.


Conferences:
- I have actively participated in +20 international workshops and conferences.
- I have organized a research workshop in QUB (UK)


Outreach&other activities:
- Outreach fair to illustrate quantum effects in biological processes for the general public
- Youtube videos/talks: i) Quantum control of spin-boson systems via shortcuts to adiabaticity, ii) Critical phenomena in the quantum Rabi model
- Referee of several high-impact journals (Phys. Rev. Lett., Phys. Rev. X, PRX Quantum)


Awards/distinctions:
- Visiting Researcher, QUB (UK) during 2021.
- IOP Trusted Reviewer, Distinguished Referee of Eur. Phys. J.
- Springer Thesis prize recognizing Outstanding PhD Research
- MSc Thesis: High honors, best grade 2012 promotion

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| **Área Temática:** | Ciencias físicas |
| **Nombre:** | CARDILLO , ALESSIO VINCENZO |
| **Referencia:** | RYC2023-044587-I |
| **Correo Electrónico:** | alessio.cardillo15@gmail.com |
| **Título:** | Complex networks: structure and coevolutionary dynamics |

**Resumen de la Memoria:**

My broad curiosity has led me, from the very beginning of my career, to explore applications of physics outside its canonical domains. Over time, I have had the chance to collaborate with scientists with different backgrounds and leverage these partnerships to strengthen and enrich my knowledge. As I grew up (scientifically and by birth), I have increased my level of leadership by carrying out more independent research projects (sometimes by securing dedicated funds to carry out my research activity). At the same time, I have also had the chance to teach and supervise students (both MSc and PhD).

My research stands on top of two main pillars: one is the characterization of the structural properties of systems whose pattern of interaction can be encoded as a network (graph). The other pillar is the study of collective behaviors (dynamics) in systems whose elements can be modeled as the nodes of a network. The first part of my career has seen more contributions from the first pillar, whereas the most recent part of my career has seen more contributions from the second pillar. Despite the maturity of the field, and the achievements of applying statistical physics and nonlinear dynamics methods to study complex networked systems, I believe that there is still (a lot of) work to do.

As Ramon y Cajal fellow, I plan to follow the track laid down throughout my whole career and push it forward by working on the filtering of weighted networks (i.e., extracting the most "relevant" connections of a network), as well as on a novel type of dynamical processes know as coevolutionary dynamics (i.e., dynamical processes combining together more than one type of process). These distinct, yet intertwined, lines of research will allow me to become acknowledged as an expert in the field of complexity science (especially from the physics perspective) and, ultimately, secure a permanent position in the Spanish academic system.

**Resumen del Currículum Vitae:**

My research spans a broad range of topics related with complex systems from the perspective of statistical physics, applied mathematics, network and data sciences; tackling complexity via a blend of methodologies rooted in physics, nonlinear dynamics, and computer science. I am interested in understanding the structural properties of systems represented as networks/graphs, as well as grasping the mechanisms responsible for the emergence of collective behaviors like synchronization, pandemic spreading, and the emergence of cooperation in social and biological systems.

My publication record reflects my my broad range of interests both in terms of topics, as well as venues (either focused in physics/nonlinear dynamics or multidisciplinary). Overall, my publications have accrued more than 1750 citations with an h-index of 15 (source: ISI Web of Science).

I have participated to several scientific projects: sometimes as a member, and other times directly as principal investigator (PI). I have been the PI of my Juan de la Cierva Incorporación, one Postdoc grant at the University of Balearic Islands, and three smaller grants to perform scientific visits; overall securing more than 130000€ of funds. Moreover, I have participated -- among others -- in one ERC-STG project, one SNSF Synergia project, and one EU-FP7-ICT project (overall funding > 9M€). I have co-organized one edition of the "Mediterranean School on Complex Networks" an international multidisciplinary PhD school. Finally, I am the creator and curator of six publicly available datasets on networked systems.

I have gained experience in teaching both at the under- and graduate level. In particular, during my fellowship at EPFL I have worked as teaching assistant in two courses (BSc and MSc) for three years (delivered, overall > 350h of lectures). Also, I have taught courses at doctoral schools on advanced topics like science of science, social dynamics, and evolutionary game theory on networks. I have mentored four MSc students (all at EPFL), and co-supervised two PhD.

I have had the chance to disseminate the results of my research in more than twenty international conferences/workshops (including three as keynote speaker), and I have been invited to give talks to several institutions. My propensity to relocate -- together with my broad curiosity -- has let me establish multidisciplinary partnerships with researchers having different backgrounds. I have dedicated some time to hone skills not strictly related with the scientific aspects of my job. For this reason, I have attended courses aimed at improving my visual/oral communication skills, as well as my leadership abilities. Finally, between 2020 and 2021 I have benefited of 12 weeks of parental leave.

**Resumen de la Memoria:**

Future Gravitational Wave (GW) observatories, such as the LISA mission, are going to be signal dominated. This means that multiple sources will generate overlapping GW signatures in the data. Some of those sources are expected to be so abundant, that will generate a stochastic confusion-type of GW signal, dominating significant frequency segments of our instruments' sensitivities. In addition, we expect quite different types of signals. For example, the supermassive Black Hole (BH) Binaries will generate transient waveforms, while the stellar-mass BHs and the Double White Dwarfs will generate almost monochromatic signals. On the other hand, we expect fast bursts, and even stochastic GW signals with astrophysical and potentially cosmological origin. Similar situation is expected for the future terrestrial Einstein Telescope and Cosmic Explorer, where a signifiant increase of events is expected compared to our current ground observatories.

For the above reasons, we need to develop robust data analysis methodologies, capable of disentangling different types of overlapping signals. Previous efforts, have been concentrated to Global Fit analyses in frequency domain, which are based on Bayesian trans-dimensional sampling algorithms. For my current five-year plan, I have designed a novel approach for a Global Fit analysis pipeline, based entirely on a Time-Frequency representation of the data, and in particular on the recently introduced superlet transformation, which guarantees optimal temporal and frequency resolution. In more details, I am going to develop this very flexible analysis framework, where each waveform signal can be decomposed to an ensemble of superlets "packets", their number and parameters to be determined dynamically with our dynamical Bayesian sampler (Eryn). This pipeline, will be more robust against data outliers, or waveform missmodelling, allowing us to extract the maximum science potential from the data.

The resulting toolbox will have the capabilities of analysing any type of signal, where long-lived, transient, or stochastic, at any given frequency range. This means that we can a global analysis tool, suitable for any kind of GW observatory. With this novel methodology, I plan to perform hierarchical Bayesian analyses on the recovered populations of sources, with the aim of probing our Galaxy. At the same time, by utilising novel Machine Learning techniques, we can train Neural Networks to the recovered posteriors of our Global Fit pipeline, and build models capable of swiftly estimating sky position and time of merger of binary objects, thus allowing us to perform multi-messenger astronomy. In addition, an optimally performing pipeline will allow us to perform better searches in the residuals for cosmological signals that are stochastic in nature.

Finally, provided that I am awarded this opportunity, my ultimate plan is to essentially lead the data analysis division of the Spanish Contribution to the future LISA mission, as well as support our colleagues in analysing the data of future 3G detectors.

**Resumen del Currículum Vitae:**

My research revolves mainly around Gravitational Wave (GW) physics, astrophysics, cosmology, and data analysis. This includes both pure science and data analysis aspects, such as binary population properties or compact binaries parameter estimation, but also projects focusing on instrument calibration and data pre-processing. Concerning my future work and projects, I am excited about the astrophysics and cosmology that is going to be enabled with our future GW observatories, especially due to their complementarity to our electromagnetic observations.

I have graduated from the School of Applied Mathematical and Physical Sciences of the National Technical University of Athens in 2010, and then started my PhD studies at the Autonomous University of Barcelona (UAB) and the Catalan Institute of Space Sciences (IEEC). During my post-graduate studies I have contributed to the development of hte parameter estimation algorithms and the data analysis pipelines to be used during mission operations of the LISA Pathfinder (LPF). After my defence in 2015, I started my first postdoc at the Max Planck Institute (Albert Einstein Institute) in Hannover. The LPF mission was launched at the same time, and I undertook the roles of Scientist on Duty and Data Analyst during mission operations, while at the same time I contributed to the design of analysis experiments that were performed on-board the satellite.

Then I moved to Paris to work at the laboratoire Astroparticule et Cosmologie, focusing on the search and characterization of stochastic Gravitational Wave signals with the future Laser Interferometer Space Antenna (LISA) mission. Those signals will have both astrophysical and cosmological origins, and therefore their detection will have immense scientific value. However, there are significant data analysis challenges to overcome, because LISA is going to be a signal-dominated observatory. For that reason, and starting with my second postdoc in the Aristotle University of Thessaloniki (AUTh) in Greece, we begun our own collaboration (GR-FR-GER) for the development of a Global-Fit pipeline, which aims to simultaneously fit all thousands of the LISA signals. This project was partially funded by the ESA Prodex program which basically funded my position at the AUTh. Currently, I am continuing my work through my MSCA-funded project, now focusing on producing low-latency triggers for enabling multi-messenger astronomy with LISA and optical observatories.

I have been supervising numerous Bsc and Msc thesis of students from different institutes, and since mid-2022, I nave been supervising my first PhD student, at the Department of Physics at the AUTh. I have also been a member of the LISA Consortium since its founding, and recently joined the Virgo collaboration. Within the Consortium, I have been heavily contributing to the development of the LISA mission (Task Teams, Working Groups, mission definition and adoption documents). Finally, I have recently been elected to the governing board of the Hellenic Society on Relativity Gravitation and Cosmology, and I was recently invited to join the panel of Astronomy and Fundamental Physics Panel of the European Space Sciences Committee (ESSC), a body which offers advice concerning space policy to the European Commission and ESA. My h-index is calculated to 22 according to NASA-ADS and 30 according to google scholar.

**Área Temática:** Ciencias matemáticas
**Nombre:** HASSAINIA , ZINEB
**Referencia:** RYC2023-043706-I
**Correo Electrónico:** zineb.hassainia@nyu.edu
**Título:** Research Scientist

**Resumen de la Memoria:**

My main research interests center around the analysis of nonlinear Partial Differential Equations arising from fluid mechanics and geophysics. I am particularly interested in exploring vortex dynamics, the emergence of ordered structures in turbulent flows, incompressible limit problems, well-posedness for stratified fluids, magnetohydrodynamics fluids and Incompressible Viscous Plasmas as well as the bifurcation and KAM theories. My research findings have been published in a range of prestigious journals such as Inventiones mathematicae, Memoirs of the American Mathematical Society, Communications on Pure and Applied Mathematics, Archive for Rational Mechanics and Analysis, Communications in Mathematical Physics, among others. In addition, I have six preprints, which are currently available on arXiv and are undergoing revisions for high-impact journals. My research in Fluid Mechanics has garnered considerable recognition in the academic community, as evidenced by the substantial number of citations it has received. To date, my work has amassed 426 citations on Google Scholar, underscoring its impact and influence among esteemed researchers in the field. I am actively engaged in multiple ongoing collaborations with international researchers. I am genuinely enthusiastic about my expertise and the trajectory of my research. Over the years, my work in vortex dynamics has allowed me to delve interesting mathematical models and complex techniques, uncovering novel insights into the behavior of vortices and the dynamics of fluid systems. As I embark on future research endeavors, I am excited about the prospect of further expanding our understanding of new intricate phenomena in fluid mechanics and geophysics. The challenges and opportunities that lie ahead fuel my passion for pushing the boundaries of knowledge, and I look forward to contributing meaningfully to the ongoing dialogue in this dynamic and evolving field.

**Resumen del Currículum Vitae:**

From 2007 to 2010, I pursued my undergraduate studies in Mathematics at the University of Batna, where I achieved the top rank in the class of 2010. Subsequently, I completed a master's degree in Mathematics at the same university, earning the first position in the graduate class of 2012. I was awarded a Franco-Algerian PhD Excellence Scholarship (2012-2015), ranking second among candidates from 21 universities. This scholarship supported my doctoral research at the University of Rennes 1 in France under the supervision of Taoufik Hmidi. My doctoral research focused on the analysis of Partial Differential Equations arising from Fluid Mechanics, culminating in the defense of my PhD thesis titled "Vortex Dynamics for Some Non-linear Transport Models." Following my PhD, I served as a Courant Instructor at the Courant Institute of Mathematical Sciences at New York University from September 2015 to August 2018. Currently, I hold the position of research scientist at New York University Abu Dhabi and I am a member of the Center of Instability, Stability, and Turbulence.

Throughout my academic journey, I have actively engaged in collaborative research resulting in numerous publications in high-impact journals. I have actively contributed to the field of mathematics with eleven published papers most of them are Q1 in the JCR ranking, with six classified as D1. In addition, I have six preprints, which are currently available on arXiv and are undergoing revisions for high-impact journals. I have collaborated with esteemed researchers from international institutions. such as F. de la Hoz from the University of the Basque Country, T. Hmidi from NYU Abu Dhabi, J. Mateu from UAB, C. García from UGR, E. Roulley from SISSA, M. Wheeler from the University of Bath, M. Berti from SISSA, H. Houamed from NYU Abu Dhabi, D. Arsénio from NYU Abu Dhabi, and N. Masmoudi from CIMS, NYU & NYU Abu Dhabi.

My research holds significant implications in the Fluid Mechanics community, with international impact demonstrated by the substantial number of citations. To date, my work has garnered 426 citations on Google Scholar, reflecting its recognition and influence among esteemed researchers in the field.

The findings of my research have been shared at various international conferences and seminars, with a total of 23 invited talks spanning across prominent locations such as France, Spain, Italy, Germany, the United Kingdom, the United States, Japan, and Switzerland.

I co-organized a conference on long time behavior and singularity formation in PDEs at NYUAD and I am currently serving as a co-organizer for the 14th American Institute of Mathematical Sciences conference in December 2024. Moreover, I actively contribute to the scholarly review process as a referee for reputable journals listed in the Journal Citation Reports (JCR), including Annales Henri Poincaré, SIAM Journal on Mathematical Analysis, Discrete and Continuous Dynamical Systems-A, Archive for Rational Mechanics and Analysis, Indiana University Mathematics Journal, Duke Mathematical Journal, and Communication in Mathematics.

I taught diverse array of mathematics courses, ranging from Calculus I and Calculus II to Linear Algebra and Real Analysis, Partial Differential Equations and Ordinary Differential Equations.

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| **Área Temática:** | Ciencias matemáticas |
| **Nombre:** | BOCCATO , CHIARA |
| **Referencia:** | RYC2023-043372-I |
| **Correo Electrónico:** | chiara.boccato@unimi.it |
| **Título:** | Universality and disorder in interacting many-body systems |

**Resumen de la Memoria:**

The core of my research is the study of interacting quantum many-body systems. While at the microscopic level we describe interacting particle systems through the linear Schroedinger equation, at the macroscopic level we observe an exciting variety of emergent effects, such as phase transitions, universality and nonlinear behavior. In this context the problem is affected by the "curse of dimensionality", preventing us from finding exact or numerical solutions. Moreover, in the most interesting regimes perturbation theory fails. The mathematical challenge here is to capture the effective behavior through effective theories and renormalization approaches.

In my past research projects I focused on the study of the interacting Bose gas: this is a paradigmatic example of a quantum many-body system displaying a phase transition, called Bose-Einstein condensation, which occurs below a certain critical temperature. In strongly interacting regimes particle positions are deeply correlated and the effect of correlations manifests in macroscopic observable quantities such as the ground state energy. In fact, it is only due to correlations that many macroscopic properties do not depend on the details of interactions, but only on a universal parameter called the scattering length. While in the past I obtained crucial universality results on the Bose gas at zero temperature, one of my current research lines is to investigate bosonic systems at the critical temperature.

The methods developed for bosonic systems are often applicable also to systems of fermions. In a current project, funded by the Italian Ministry of University and Research through a PRIN 2022 grant (165k euro), I study interacting systems in presence of magnetic fields with the aim of providing an effective description of the Quantum Hall effect. The quantum Hall effect is one of the most prominent manifestations of microscopic quantum effects at a macroscopic level, through the quantization of the conductivity.

Another research line I plan to investigate is the effect of disorder in Bose-Einstein condensates. We model disorder through Poisson distributed impurities; in this context most of the literature considered up to now only noninteracting bosons. The goal is to understand the effect of interactions in relation to localization and delocalization regimes.

Recently I have also started to work on the Ising model; this is another example of interacting many-body system displaying a phase transition and universality. I plan to consider a model with disorder, described through a quasi-periodic external potential. We expect to be able to prove that energy correlations decay with the same critical exponents as for the model in absence of disorder.

**Resumen del Currículum Vitae:**

I am an assistant professor, non tenure track ("ricercatore a tempo determinato di tipo A"), at the University of Milan, Italy. I obtained my PhD from University of Zurich in 2017 under the supervision of Prof. B. Schlein. I then worked as a postdoc at the Institute of Science and Technology Austria (ISTA) in Klosterneuburg (Vienna) from 2017 to 2021 in the group of Prof. R. Seiringer.

My research interests are centered on many-body quantum mechanics. I study emergent phenomena arising in complex systems composed of a large number of interacting particles with methods of functional analysis. My current research projects focus on Bose-Einstein condensation, effective theories for quantum Hall systems, renormalization group analysis of the Ising model and Bose gases in disordered environments.

I have 9 peer-reviewed publications, of which 1 in Acta Mathematica, 1 in Journal of the European Mathematical Society and 2 in Communications in Mathematical Physics. My work received 244 citations according to Scopus.

I am currently local coordinator of the PRIN 2022 grant from the Italian Ministry of University and Research for the project "Interacting Quantum Systems: Topological Phenomena and Effective Theories", in collaboration with the University of Rome La Sapienza (165k Euro).

I have given several invited presentations at international congresses and seminars, and a minicourse at a workshop at TU Munich in 2023. I have a strong network of international collaborators from European and American Universities.

I have experience in teaching courses in Analysis, Mathematical Physics and Programming at the Master and Bachelor level for Mathematics, Physics and Natural Sciences students. Moreover, I have experience in the supervision of a Master student.

I took part in the organization of two conferences and a summer school. I currently organize a joint seminar with other two universities.

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| **Área Temática:** | Ciencias matemáticas |
| **Nombre:** | GARCIA MARTINEZ, LUIS EMILIO |
| **Referencia:** | RYC2023-044008-I |
| **Correo Electrónico:** | luigarm2@gmail.com |
| **Título:** | Automorphic forms and applications to arithmetic and geometry |

**Resumen de la Memoria:**

Mi area de investigaciòn es la teoría de números. Me interesan sobre todo las aplicaciones de las formas automorfas a cuestiones de geometría y aritmética.

Tras realizar estudios de Licenciatura en Matemáticas en la Universidad de Valencia y de Ingeniería Superior de Telecomunicación en la Universidad Politécnica de Valencia, obtuve una beca Fulbright y me marché a realizar el doctorado en la Universidad de Columbia en Nueva York. Tras ello pasé por varias estancias postdoctorales (en Reino Unido, Canadá y Francia). En 2019 obtuve un puesto permanente como Lecturer en University College London.

He publicado artículos en algunas de las mejores revistas generalistas, entre ellas Inventiones Mathematicae, Crelles Journal y Advances in Mathematics. He dado charlas en algunos de los seminarios de teoría de números más reconocidos y en varias conferencias internacionales.

Actualmente trabajo en dos líneas de investigación independientes. La primera trata de aplicaciones de la teoría de series theta a cuestiones de geometría enumerativa que interesan a investigadores en geometría algebraica y mirror symmetry. La segunda desarrolla métodos introducidos en mis trabajos conjuntos con N. Bergeron y P. Charollois con el objetivo de comprender mejor las conjeturas de Stark en teoría algebraica de números.

**Resumen del Currículum Vitae:**

DATOS PERSONALES

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Open Researcher and Contributor ID (ORCID) 0000-0002-5129-7065


SITUACIÓN PROFESIONAL ACTUAL

Desde Septiembre de 2019: contrato indefinido como Lecturer en University College London (Department of Mathematics)


SITUACIÓN PROFESIONAL ANTERIOR

2018 - 2019 Postdoctoral Fellow / University of Toronto
2017 - 2018 Postdoctoral Fellow / IHES
2015 - 2017 Postdoctoral Fellow / University of Toronto
2013 - 2015 Research Associate / Imperial College London


FORMACIÓN ACADÉMICA

- PhD Columbia University in the City of New York, Mayo 2013

- Licenciado en Matemáticas, Universitat de València, 2006

- Ingeniero de Telecomunicación, Universidad Politécnica de Valencia, 2005


TEMAS DE INVESTIGACIÓN¿

Teoría de números y de representaciones. Formas automorfas y series theta. Variaciones de estructura de Hodge. Conjeturas de Stark.

Comentario sobre producción científica: en mi área de investigación (la teoría algebraica de números) la frecuencia de publicación es más baja que en otras. Por otra parte los trabajos suelen ser mucho más largos (mi artículo más largo tiene 113 páginas y el más corto tiene 35). Cuando los artículos aparecen en buenas

revistas, un promedio de un artículo al año se considera una frecuencia de publicación más que razonable. Me gustaría tambièn aclarar que en estos momentos tengo tres preprints que no aparecen en el CVA, dos de ellos pendiente de recibir informe de referee.

Charlas invitadas y congresos: ver CVA

APORTACIONES MÄS RELEVANTES

1 Artículo científico. Jeff Achter; Ali Altug; Luis E. Garcia; Julia Gordon. 2023. Counting abelian varieties over finite fields via Frobenius densities. Algebra and Number Theory. Mathematical Sciences Publishers. 17-7, pp.1239-1280.

2 Artículo científico. Nicolas Bergeron; Pierre Charollois; Luis E. Garcia. 2023. Eisenstein cohomology classes for GL(N) over imaginary quadratic fields. Crelles Journal. De Gruyter. 2023-797, pp.1-40.

3 Artículo científico. Nicolas Bergeron; Pierrre Charollois; Luis E. Garcia. 2020. Transgressions of the Euler class and Eisenstein cohomology of GL(N,Z). Japanese Journal of Mathematics (Special Feature: the Takagi lectures). Springer Verlag. 15, pp.311-379.

4 Artículo científico. Luis E. Garcia; Siddarth Sankaran. 2018. Green forms and the arithmetic Siegel-Weil formula. Inventiones Mathematicae. Springer Verlag. Online First, pp.1-113.

5 Artículo científico. Luis E. Garcia. 2017. Superconnections, theta series, and period domains. Advances in Mathematics. Elsevier. 329, pp.555-589.

6 Artículo científico. Luis E. Garcia. 2016. Regularized theta lifts and (1,1)-currents on GSpin Shimura varieties. Algebra and Number Theory. Mathematical Sciences Publishers. 10, pp.597-644.

7 Libro o monografía científica. Nicolas Bergeron; Pierre Charollois; Luis Garcia. 2023. Cocycles de groupe pour GL(N) et arrangements d'hyperplans. CRM Monograph Series. American Mathematical Society. 39.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias matemáticas |
| **Nombre:** | KOSOV , EGOR |
| **Referencia:** | RYC2023-043616-I |
| **Correo Electrónico:** | kosoved09@gmail.com |
| **Título:** | Analysis, probability, and discretization. |

**Resumen de la Memoria:**

The applicant's area of research lies at the intersection of probability theory, measure theory, functional analysis, and approximation theory, and includes such topics as Gaussian, logarithmically concave, and general measures on finite and infinite dimensional spaces, probabilistic and analytic properties of distributions, function spaces and function inequalities, approximation and discretization.The researcher has innovative results in approximation theory, functional analysis, probability and stochastic analysis. Let us discuss some of them in more details.

1) The applicant's results concerning properties of algebraic polynomials on spaces with logarithmically concave measures quantitatively and qualitatively improve upon the previous results of I. Nourdin, D. Nualart, G. Poly, Yu. Davydov, S. Bobkov, M. Rudelson. These results brought significant attention of the researchers working in the field and were cited by such specialists as I.Nourdin, V. Bally, F. Viens, G. Poly, L. Caramellino, Kh. Es-Sebaiy, V. Bogachev. Working on problems in this area, the researcher got acquainted with the powerful localization technique for reducing high dimensional problems to problems in lower dimensions.

2) The study of the regularity properties of distribution densities of polynomials led the researcher to develop a new Malliavin-type technique of investigation low regularity properties of distributions. This technique is based on a new equivalent description of the classical $L^p$-modulus of continuity. He applied the developed technique to study regularity properties of distributions of random vectors with components from Sobolev classes.

3) The applicant has also achieved important results concerning the problem of integral norms sampling discretization. The results were cited and used by other researchers such as D. Krieg, M. Ullrich, K. Gröchenig, J. Ortega-Cerdà, F. Dai, A. Prymak, S. Tikhonov, D. Freeman. While working in this area, the researcher got familiar with and has further developed a very useful chaining technique that combines probabilistic and analytic approaches.

4) Recently, the applicant started to study properties of the probability solutions to the Fokker–Planck–Kolmogorov equations on infinite dimensional spaces. In particular, jointly with V. Bogachev and A. Shaposhnikov, the researcher proved new results concerning the integrability of the solutions to such equations under Orlicz-type assumptions on the drift coefficient.

**Resumen del Currículum Vitae:**

The applicant earned his PhD in May 2018 at Lomonosov Moscow State University and recieved Habilitation degree in January 2023 at Steklov Institute of Mathematics. His area of research includes probability theory and stochastic analysis, functional analysis, and approximation theory. In particular he is studying Gaussian, logarithmically concave, and general measures on finite and infinite dimensional spaces, probabilistic and analytic properties of distributions, and sampling discretization problems. The researcher published his first results on infinite dimensional measure theory as a single author at the age of 20, being a third year bachelor student. Overall he has published 35 research papers, 14 of which are single authored. The applicant is also open to possibilities of collaborating with other mathematicians from different fields. In particular, he already has successfully collaborated with several prominent mathematicians such as I. Nourdin (University of Luxembourg), F. Dai (University of Alberta), V. Temlyakov (University of South Carolina), S. Tikhonov (ICREA-CRM), V. Bogachev (Lomonosov Moscow State University). The applicant has 140 overall citations and h-index of 7 (according to Scopus). The researcher is currently mentoring two master students from Lomonosov Moscow State University, Vadim Gorev and Anastasiya Zhukova. Both of them successfully defended their bachelor's theses under his supervision in 2023. The applicant is actively involved in the reviewing process for various leading mathematical journals. Among others, he has served as a referee for Journal of the European Mathematical Society, Applied and Computational Harmonic Analysis, Constructive Approximation.

Applicant's outstanding achievements were already recognized with several awards and prizes, such as
1) Marie Sklodowska-Curie Fellowship, Project ID: 101109701, 2023-2025.
2) Habilitation degree (Doctor of Sciences degree in Russia), 2023.
3) Laureate of the Moscow Mathematical Society Prize, 2021.
4) Young Russian Mathematics 2019 award (for young researchers holding a degree).
5) Young Russian Mathematics 2016 award (for postgraduate students).
6) Scholarship of the Lomonosov Moscow State University to young researchers, 2019,
2020, 2021.
7) Presidential Scholarship for Excellent Students, 2016.

The researcher was one of the main organizers of several international conferences and workshops, including the following recent ones:
1) Conference on the Theory of Functions of Several Real Variables, dedicated to the 90th anniversary of O.V. Besov (29.05.2023-02.06.2023);
2) Workshop "Discretization and related questions" (06.12.2021-10.12.2021);
3) Workshop "Dispersion and fixed volume discrepancy" (13.12.2021);
4) Workshop "Sampling recovery and related problems" (21.12.2021-26.12.2021).

The researcher is currently a Marie Sklodowska-Curie Postdoctoral Researcher at Centre de Recerca Matemàtica (Spain). His previous positions includes Senior Research Fellow at Steklov Institute of Mathematics, Associate Professor at Lomonosov Moscow State University, Associate Professor at National Research University Higher School of Economics, Senior Research Fellow at the International Laboratory of Stochastic Algorithms and High-Dimensional Inference, and Senior Research Fellow at the laboratory "High-dimensional approximation and applications".

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| **Área Temática:** | Ciencias matemáticas |
| **Nombre:** | KEGEL , MARC |
| **Referencia:** | RYC2023-043251-I |
| **Correo Electrónico:** | kegelmarc87@gmail.com |
| **Título:** | Experiments and algorithms around the census L-space knots |

**Resumen de la Memoria:**

My guiding motivation in this proposal is to understand in which ways 3-manifolds arise as Dehn surgeries on knots, in particular, I want to understand L-space knots. I would like to find a topological characterization of L-space knots and understand their relation to hyperbolic geometry. For that, I will algorithmically and theoretically deeply analyze Dunfield's census knots, the hyperbolic knots with the simplest complements. It turns out that approximately half of them are L-space knots and some more are fibered and induce the standard tight contact structure. This suggests a relation between contact geometry and Heegaard Floer homology on the one side and hyperbolic geometry on the other side that is not yet understood. I also plan to study related algorithmic questions and projects in knot theory, the theory of Dehn surgery, and contact geometry.

For further details on my research project I refer to the technical and scientific report.

More concretely this is divided into 9 projects with the following goals.

- K1: Demonstrate the existence of infinitely many hyperbolic L-space knots that are not braid positive by lifting Ito's braid positivity obstruction from the HOMFLYPT polynomial to the HOMFLYPT homology.

- K2: Create and analyze a database of all popular knot invariants for the census knots.

- S1: We proved that there exist non-isotopic knots that share exactly four different surgeries, which disproves a conjecture in the field. We want to generalize this result to construct non-isotopic knots that share an arbitrary but finite number of surgeries.

- S2: Show that not every lens space can be obtained by integer surgery along a 2-component link. Here we will combine an excessive computer search with Donaldson's theorems A and B.

- S3: Describe an explicit upper bound on the number of Kirby moves needed to transform a given surgery link of the 3-sphere in the empty diagram. This will be done by relating surgery diagrams to triangulations where an upper bound on the Pachner moves is known.

- S4: Develop an explicit construction method demonstrating that any rational number arises as non-characterizing slope of some knot.

- S5: Demonstrate that the set of alternating surgeries for a given L-space knot is computable and analyze these further.

- S6: Study symmetry-exceptional slopes and other unexplored exceptional behavior.

- C1: Describe an explicit list of contact Kirby moves that suffice to relate any two contact surgery diagrams of the same contact manifold.

**Resumen del Currículum Vitae:**

I obtained my Ph.D. at the University of Cologne in 2017 under the supervision of Prof. Geiges on a topic in 3-dimensional contact geometry. After that, I was offered a position as visiting lecturer at the Humboldt-University Berlin in the working group of Prof. Wendl. This is a special independent postdoc position with tasks and duties very similar to a Junior Professor position. I was teaching every semester my own courses and seminars in the area of geometry and topology of around 4 academic hours every week.
During this time I have also developed my own research agenda, which is evident from the original project ideas explained below.

Since obtaining my Ph.D., I have accumulated seven years of research experience in pure mathematics. During this period, I have published 17 articles published in JCR journals, with 5 more currently under review. In that time I have developed my own research agenda, which is evident from the original project ideas explained in the scientific and technical report.

My research primarily focuses on symplectic geometry and geometric topology, specifically in areas such as knot theory, Dehn surgery on 3-manifolds, smooth 4-manifolds, contact geometry, and their interactions. I employ computer experiments and verified computer methods to explore these fields. For a concise overview of some of my current research projects and their alignment with the broader scope of geometric topology, please refer to the scientific and technical report.

I maintain collaborations with a total of 34 researchers in 11 different countries, including Australia, Austria, Canada, India, Italy, Germany, the Netherlands, Spain, Switzerland, the USA, and Turkey.

Several of my collaborators are world leading experts in their respective fields. On the other hand, I have been particularly successful in involving students in my research. To date, I have supervised 12 bachelor's and 3 master's theses, with 3 more currently in progress. In all of these theses,

students have successfully worked on open and interesting research questions, some of which have led to publications (in total this has yield to 5 publications of my students).

Moreover, I have successfully engaged students in larger research projects. Project K2, as outlined in the scientific and technical report, and several of its follow-up projects originated from a lecture on 4-manifolds that I conducted in 2021 in Berlin. Collaborating with around 10 students from that lecture and other researchers from my network, we started studying the census knot invariants (see Project K2 for details). This initiative has provided students with early-stage research experience and facilitated connections with researchers from other countries. Thus most of these students could find easily Ph.D. positions at different places around the world. So we are continuing our project online. We will soon publish our first results in that project, but there are several more open questions from our project that we plan to tackle in the future.

Since this summer, I have also serving as supervisor for the Ph.D. thesis of Chun-Sheng Hsueh. For his project we got funding for 3 years from the Claussen-Simon foundation, that we are using for paying his salary and his research visits to our collaboration partners. Additionally, I am assisting in the supervision of Naageswaran Manikandan, with Chris Wendl as the main supervisor.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias matemáticas |
| **Nombre:** | MUÑOZ MATUTE, JUDIT |
| **Referencia:** | RYC2023-045172-I |
| **Correo Electrónico:** | judith.munozmatute@gmail.com |
| **Título:** | Stabilized minimum residual methods for transient partial differential equations |

**Resumen de la Memoria:**

Many mathematical models for real-life applications employ Partial Differential Equations (PDEs) to describe the underlying physical phenomena. The analytical solutions of those equations are not available in general so the use of computational simulations is crucial to understanding and predicting the physics involved. My interdisciplinary research focuses on: (1) Stabilized discretization methods for transient PDEs. (2) Deep learning algorithms for PDEs.

During my postdoctoral period, I mainly focused on designing new computationally efficient and unconditionally stable numerical simulation solvers for approximating transient PDEs. In particular, I worked on the Discontinuous Petrov-Galerkin (DPG) method, a Minimum Residual (MinRes) method for solving challenging PDEs that present instabilities when solving with traditional discretization methods like the finite element method. The DPG method was introduced in 2010 and has been applied to solve a wide variety of challenging engineering problems and in many industrial applications. However, most of the DPG work was developed for problems in the frequency domain, and a robust derivation and an efficient implementation of the DPG method for time-dependent problems remained challenging for more than a decade. In this work, I applied the DPG method in the time dimension for the first time in the literature to create new temporal solvers for linear transient PDEs, opening a whole new research line. Because of his breakthrough, I was awarded a Marie-Curie Global Individual Fellowship to continue with the development of this new research line at the Oden Institute for Computational Engineering and Sciences (USA) and the Basque Center for Applied Mathematics (Spain). Recently, I also took the lead in the development of stabilized MinRes Deep Learning (DL) algorithms for PDEs to overcome the stabilization problems of classical DL techniques and guarantee the robustness of the DL-based approximation algorithms. I have published 16 research articles on these topics in prestigious journals with 15 coauthors worldwide, including 2 in collaboration with Sandia National Laboratories in the USA.

Finally, I have recently extended the theory I developed during the Marie-Curie project to general non-linear time-dependent PDEs, going beyond the goals originally set in the fellowship. Employing a variational formulation in time, I constructed a whole family of new multistage methods that are computationally efficient and unconditionally stable. This work has opened new research lines where I can target more challenging problems. I am currently collaborating with US Air Force to apply this new methodology for solving the non-linear Schrodinger equation to predict the behavior of optical solitons, which are critical for the design of fiber amplifiers in optics applications. I am also applying this method for solving non-linear advection-diffusion-reaction models that are employed in biology applications like predicting the evolution of glioblastomas or the dynamics of the brain clearance mechanisms. Finally, this novel work, coupled with my expertise in MinRes methods and DL techniques, has laid the groundwork for my upcoming research trajectory, which is the development of DL-based stabilized solvers for the approximation and inversion of non-linear transient PDEs with applications to physics and biology

**Resumen del Currículum Vitae:**

I graduated in 2019 with a PhD in Applied Mathematics with Cum Laude and the "Mención Internacional'' from the University of the Basque Country (UPV/EHU) under the supervision of D. Pardo and E. Alberdi. In 2020, I was awarded the Vicent Caselles Mathematical Research Award by the Royal Spanish Mathematical Society (RSME) and the BBVA Foundation. I was also elected by the Spanish Society of Applied Mathematics (SeMA) as the Spanish candidate for the European ECCOMAS awards for the best PhD thesis in 2019 in Computational Methods in Applied Sciences and Engineering. In 2020, I obtained a postdoctoral grant from the Basque Government to work at the Basque Center for Applied Mathematics (BCAM) in Bilbao, Spain and the Oden Institute for Computational Engineering and Sciences (OICES) at the University of Texas in Austin, USA (ranked #1 department in the world in interdisciplinary applications of mathematics). In January 2021, I moved to the USA to work at OICES within the group of L. Demkowicz, highly cited researcher and assistant director of OICES. In 2022, I was awarded a European Marie-Curie Individual Fellowship to lead a 3-year research project called GEODPG between OICES (2022-2023) and BCAM (2024).

During my career, I have published 16 research articles (14 of them in Q1 journals). I currently have two articles under review and four more in preparation that I will submit in early 2024. I have participated in 8 research projects (+2 under review), including two EU Horizon 2020 RISE programs that allowed me to perform several international research stays. As a result, my research articles include 15 co-authors across 8 different institutions. During my stay in the USA, I have also established collaborations with researchers from U.S. Sandia National Laboratories and U.S. Air Force to transfer the results from GEODPG (resulted in 2 published articles and expecting 2 more for 2024). Finally, I am the PI of BCAM of a European Union's MSCA Doctoral Network (2.3 million €). In the summer of 2024, I will start supervising a PhD student at BCAM with G. Sangalli (Pavia) as co-advisor. I recently applied as PI for two other projects that are now under review: (1) An H2020 MSCA Staff Exchange program as PI of BCAM, and (2) A project of the Ministry of Science and Innovation as PI alongside M. Croci.

I have presented my work at 21 national and international conferences, 9 of them by invitation. I have also delivered 6 seminars and participated in 6 workshops. I have organized 5 minisymposium at 5 international conferences. I am the main organizer of the MinRes&LS FEM international workshop that will be held at BCAM in June 2024, attracting the best world scientific leaders in my area of expertise. I am also part of the organizing committee of the VII Congreso de Jóvenes Investigadores de la RSME that will take place at the UPV/EHU in 2025. I am an active peer-reviewer for 6 Q1 journals.

Finally, I am devoted to giving visibility to women in Science, Technology, Engineering, and Mathematics (STEM). I am a mentor in the STEM Muse mentorship program organized by UT Austin. I am included in the "Científicas e Innovadoras" platform. I actively collaborate in outreach activities (>20

in 5 years) held by local newspapers, TV, and radio programs, and I often give talks in local (high) schools to inspire younger generations to pursue careers in STEM.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:**      Ciencias matemáticas
**Nombre:**             MENGUAL BRETÓN, FRANCISCO JOSÉ
**Referencia:**         RYC2023-045748-I
**Correo Electrónico:** fran_men08@hotmail.com
**Título:**             Turbulence and convex integration

**Resumen de la Memoria:**

My research area is analysis of partial differential equations, particularly those arising in fluid mechanics. My work focuses on modelling hydrodynamical instabilities. The main motivation is to understand some turbulence phenomena observed in the atmosphere and oceans, such as the Kelvin-Helmholtz and Rayleigh-Taylor instabilities. This might yield significant real-world implications, as it can contribute to improved predictions and management of natural processes. Applying the method of convex integration, we addressed questions such as the growth of the turbulence zone, the geometric evolution of the instability surface, and the macroscopic mass/energy transfer.

In the initial section of the report, I present my contributions to the mixing phenomena. This field investigates the mixing of two incompressible fluids in a porous medium due to the Rayleigh-Taylor instability. The first contribution involves the development of a quantitative hprinciple [1]. Despite the unpredictable nature of the turbulence phenomena, this approach allows to recover some macroscopic information from the subsolution. The second contribution is the existence of mixing solutions for the partially unstable Muskat problem, thus proving the continuation of the evolution of IPM beyond the breakdown of smoothness and Rayleigh-Taylor stability [2]. The third contribution is the extension of the h-principle in IPM to the case of viscosity jump [3].

In the second part of the report, I present my contributions to the turbulence phenomena. We explore two fundamental aspects of turbulent flows: anomalous energy dissipation and nonuniqueness. Anomalous energy dissipation concerns the lack of energy conservation in weak solutions of the Euler equation, which is closely related to the loss of regularity in the inviscid limit of solutions to the Navier-Stokes equation. In particular, we prove the existence of dissipative solutions for the Kelvin-Helmhotz instability [4]. Nonuniqueness refers to the loss of determinism in the Euler equation, which can be

interpreted as the extreme case of the so-called butterfly effect. In this setting, we prove in a recent preprint [5] sharp nonuniqueness of admissible solutions for the Euler equation.

**Resumen del Currículum Vitae:**

I completed my academic training, including a Bachelor's Degree in Mathematics from the Universidad de Zaragoza, a Master's and Ph.D. from the Universidad Autónoma de Madrid, and research stays at the Universität Leipzig and the Hausdorff Research Institute for Mathematics in Bonn. In recognition of the results obtained in my doctoral thesis, I was honored with the "Extraordinary Ph.D. Award in Mathematics" from the Universidad Autónoma de Madrid, and a "Margarita Salas Research Award" within the Comunidad Autónoma de Madrid. Subsequently, I pursued postdoctoral positions at the Institute for

Advanced Study in Princeton, the Universidad de Sevilla, and the Max Planck Institute for Mathematics in the Sciences in Leipzig.

The outcome of this research has been published, jointly with my collaborators Angel Castro, Daniel Faraco and László Székelyhidi, in 4 papers [1, 2, 3, 4] in Calc. Var. Partial Differential Equations, Ann. PDE, Anal. PDE, and Comm. Pure Appl. Math., some of the most important international journals in mathematics. I have disseminated this work through presentations at 13 national and international workshops. I have participated actively in 6 research projects, including two funded by the European Research Council.

Currently, I am making progress on multiple research fronts, detailed at the end of the report. These include: selection criteria for the subsolution, control of the evolution of the turbulence zone, construction of weak solutions for vortex filament data, sharp nonuniqueness in several scenarios, and construction of fast dynamos in magnetohydrodynamic. I am collaborating with international partners at the Max Planck

Institute and the University of Helsinki, as well as within Spain in universities such as Madrid, Sevilla, and Valencia.

Concerning teaching experience, I taught 5 courses over 4 years at the Universidad Autónoma de Madrid and the Universidad de Sevilla, covering both theoretical and practical aspects, and participated in the Science Week at the Universidad Autónoma de Madrid for two years.

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| **Área Temática:** | Ciencias matemáticas |
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| **Correo Electrónico:** | elba.garcia.failde@gmail.com |
| **Título:** | Enumerative geometry and integrable systems via topological recursion |

**Resumen de la Memoria:**

My interests lie at the interface between geometry and mathematical physics. More precisely, my research so far had four main different directions that nourished each other, as part of the rich web of ideas surrounding the topological recursion: intersection theory, integrable systems, combinatorics of maps and non-perturbative extensions. Topological recursion, initially discovered in the realm of large asymptotic expansions in random matrix theory, has evolved into a universal theory, revealing a common structure across diverse mathematical and physical domains. Taking a spectral curve as input, it recursively produces a family of multi-differentials living on the associated Riemann surface.

Among my contributions in algebraic geometry, the most notable ones include: solving and extending a negative analog of Witten's r-spin conjecture through a suitable deformation of a cohomological field theory we constructed. This approach also unveiled new tautological relations of the moduli space of curves. We provided novel perspectives on the positive Witten r-spin conjecture by introducing combinatorial maps to explore intersection numbers and analyzing solutions of extensions of the Airy differential equation.

I've dedicated years to promoting topological recursion to a non-pertubative formalism, capable of capturing exponentially suppressed corrections. Our ongoing efforts have recently led to applications in physics, such as accessing new instanton corrections in JT gravity, and in enumerative geometry, yielding large genus asymptotics for essential geometric objects in a universal way.

My accomplishments include solving a long-standing conjecture in free probability using the master relation, which implements a universal duality. This achievement draws on insights from various perspectives, starting from my thesis, where fully simple maps were introduced, laying the foundation for the master relation. This duality manifests in free probability, combinatorics, and topological recursion.

Regarding my contributions in combinatorics of maps, we resolved the fully simple maps conjecture demonstrating that such maps are governed by topological recursion after exchanging the roles of x and y in the spectral curve of ordinary maps. Additionally, we proved topological recursion for generalised Hurwitz numbers, incorporating internal faces, resulting in a remarkable rationality scheme for their generating series.

We gave two combinatorial proofs of the master relation for maps, revealing the connection between ordinary maps and fully simple maps through monotone Hurwitz numbers, initially discovered in my thesis. This combinatorial perspective established the relation as a universal duality.

A paramount objective is to establish a stronger connection between topological recursion and integrable systems, facilitating the transfer of techniques between the two realms. Notably, we proved the quantum curve conjecture, constructing a differential operator associated to a spectral curve, which quantifies it and annihilates the wave function derived from the output of topological recursion applied to that spectral curve.

**Resumen del Currículum Vitae:**

I received my higher education between 2007 and 2012, obtaining Bachelor's and Master's degrees in Mathematics from the University of Barcelona. I was later selected for a doctoral contract at the Max Planck Institute for Mathematics (Bonn), preceded by a qualifying year program at the University of Bonn. I obtained my PhD degree in 2018, with a thesis entitled "On discrete surfaces: Enumerative geometry, matrix models and universality classes via topological recursion" and supervised by Gaëtan Borot and Don Zagier. I was then awarded a Hadamard fellowship for a two-year postdoc at IPhT (CEA Saclay, France), and after a few months with a second postdoc position (at IRIF, University Paris Cité, supported by the ERC CombiTop) I was appointed a permanent "maître de conférence" position (associate professor) at the mathematical institute (IMJ) of the Sorbonne University.

My research is interdisciplinary, and can be placed at the intersection between geometry and mathematical physics. I have written, in collaboration with scientists based in many different countries, 15 research articles, 10 of which have been published or will appear in peer-reviewed high-level open-access journals. In addition to the publications listed below, I have submitted for peer-reviewed publication 5 preprints, two of which are currently under review after a first positive report.

I was an invited speaker at over 20 international conferences or workshops, as well as at several research seminars, and I visited many research institutes around the world, including a longer research stay at the Korteweg-de Vries Institute (Amsterdam, September-October 2017) and at the Monash University (Melbourne, February 2020), for which I was awarded a Robert Bartnik Visiting Fellowship (∼ 10000AUD). During my postdocs, I also had a one-year visiting position at IHES (Paris), and during my PhD, I spent two months at the Institut Henri Poincaré (IHP) in the context of a thematic trimester at the interface between mathematical physics, representation theory and probability.

Since 2019, I have been teaching several courses in Paris (first at École Polytechnique, then at Sorbonne Université), both at undergraduate and master level, including for instance "Combinatorics and graphs", "Probability" and "Differential equations" for 2nd year bachelor students, and "Characteristic classes" for 2nd year master students. I also gave 5 graduate or research-level mini-courses at international schools.

Throughout my career, I co-organized 7 international workshops and a school. At IMJ (Paris), where I currently work, I am an organizer of the "Enumerative geometry seminar", and in 2021-22 I organized a working group on "Topological recursion".

In recent years, I served on two international PhD committees and two associate position hiring committees in France. I am an invited editor taking care of a special issue "TR and its applications" in the Journal of Geometry and Physics (2022-2024), and I serve as a referee for various international journals.

In 2023-2024, I was awarded a sabbatical semester awarded by the Centre National de la Recherche Scientifique (CNRS). I am currently an affiliated researcher of an ERC Synergy Grant and an ANR grant.

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| **Área Temática:** | Ciencias matemáticas |
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| **Título:** | A multi-level approach to the Koopman Operator |

**Resumen de la Memoria:**

Mi trayectoria investigadora sigue una linea coherente cuyo eje director es el estudio mediante la teoría de los sistemas dinámicos de las dinámicas que se pueden producir en un sistema. Gracias a un doctorado de 4 años con Tere Seara y Gemma Huguet, pude comprender como la teoría de los sistemas dinámicos proporciona el "esqueleto" mediante el cual se pueden explicar los regímenes dinámicos que un sistema puede exhibir. Mi tesis incluyó, entre otras muchas técnicas, el estudio de bifurcaciones en sistemas autónomos y no autónomos, el cálculo de parametrizaciones y cambios de variables que simplifican la dinámica y por tanto el estudio del sistema.

Al inicio de mi doctorado, tenia una clara vocación de aplicación en contextos propios del, por entonces, emergente campo de los sistemas complejos. De esta forma, al acabar mi formación doctoral, tenia claro que quería estudiar cómo trasladar las técnicas que tanto me impresionaron como estudiante de doctorado al campo de los sistemas complejos con el objetivo de simplificar su análisis. En particular, mi formación en neurociencia matemática junto a mis estancias en laboratorios experimentales, me condujeron de forma natural a estudiar oscilaciones estocásticas.

Tuve la suerte de comenzar dicha tarea mediante reuniones online de frecuencia semanal con el matemático Peter Thomas y el físico estadístico Benjamin Lindner. Nuestro objetivo era comprender cómo el poderoso marco de descripción de sistemas deterministas oscilatorios mediante fase-amplitud (que yo había estudiado en la tesis) podía trasladarse al campo de los sistemas estocásticos. Gracias a nuestra sólida colaboración, y su ayuda para introducirme en el campo estocástico, hemos conseguido publicar 3 trabajos. Dos de ellos han sido publicados en revistas de alto impacto como Physical Review Letters y Proceedings of the National Academy of Sciences (ambos conmigo como primer autor y corresponding author). En ambos trabajos, hemos sido capaces de encontrar elegantes soluciones a problemas abiertos de carácter dinámico. Además, en ambos casos, nuestras soluciones han venido de la mano de autofunciones del operador backwards de Kolmogorov (OBK). En particular, hemos mostrado que mientras que la autofunción principal real del OBK es la función que generaliza de forma natural la amplitud determinista, la autofunción principal compleja del OBK proporciona la generalización natural del famoso formalismo de fase en osciladores deterministas.

El objeto central de estos desarrollos, el OBK (y por tanto sus autofunciones), tienen una relación directa con el objeto central de mi proyecto: el operador de Koopman. Esta conexión, nos permite vislumbrar próximas aplicaciones de la teoría en datos. Este es el marco en el que se embebe la tesis que co-dirijo con el neurocientífico Boris Gutkin y nuestra colaboración con grupos en Seattle: extraer las autofunciones de interés de series temporales experimentales, encontrando así aplicaciones efectivas de la teoría en datos.

Por tanto, aunque mis resultados encuentran contexto de aplicación en sistemas complejos, tienen una motivación clara y natural en la teoría de sistemas dinámicos aprendida como PhD. De hecho, esperamos que el proyecto que presento (que es la continuación natural de esta linea de investigación) nos permita seguir presentando resultados novedosos tanto experimentales como teóricos.

**Resumen del Currículum Vitae:**

Licenciado en Física por la Universidad de Valencia (2010) y Máster en Física de Sistemas Complejos por la UNED (2013). En 2014, mediante una beca FPI, comencé mis estudios de doctorado en el grupo de Sistemas Dinámicos de la Universitat Politècnica de Catalunya (UPC). Gracias al alto nivel de mi grupo receptor y a la dedicación de mis directoras, Tere Seara y Gemma Huguet, obtuve un alto nivel de conocimientos en el área de los sistemas dinámicos, tanto a nivel teórico como computacional. En 2019 defendí mi tesis con Cum-Laude y doctorado internacional. Como resultado de la tesis publicamos 4 artículos (3Q1s) en revistas de matemática aplicada.

Durante mi etapa postdoctoral me especialicé en el ámbito de los sistemas dinámicos estocásticos. En particular, he tratado de definir y estudiar en el contexto estocástico variables y conceptos análogos a los usados en teoría clásica de sistemas dinámicos. Esta linea de investigación ha generado resultados publicados en revistas de alto impacto (la gran mayoría conmigo como primer autor y corresponding author). En particular, a día de hoy mi producción científica comprende un total 10 artículos publicados (8Q1s con un indice h de 7), un capítulo de libro, un preprint y dos artículos en avanzado estado de preparación. He publicado en revistas como Proceedings of the National Academy of Sciences, Physical Review Letters, Communications in Nonlinear Science and Numerical Simulation, Chaos, Journal of Nonlinear Science o Plos Computational Biology.

Como investigador he visitado (mediante estancias o contratos postdoctorales) centros de reconocido prestigio como la Univ. de Exeter, instituciones francesas como el CNRS y la École Normale Supérieure (ENS) en París, la Humboldt Universitat en Berlín, la Academia de Ciencias Checa en Praga, la Univ. Complutense de Madrid (UCM), la Univ. de Sevilla o el IFISC en Palma de Mallorca entre otros. Visitar estos centros me ha permitido, además de dar seminarios en todos ellos, trabajar con investigadores como Peter Ashwin, Benjamin Lindner o Boris Gutkin entre otros. Debido a las restricciones de movilidad, mi relación con los Estados Unidos ha sido principalmente online. De esta forma, además de establecer una sólida colaboración con el matemático Peter J. Thomas, he podido dar seminarios en la CWRU o en Georgia Tech, además de participar en la prestigiosa conferencia SIAM.

Ademas de participar en diferentes proyectos nacionales como internacionales, también tengo amplia experiencia docente, la mayor parte como ayudante doctor en la UCM, donde he dado un amplio abanico de clases (desde cálculo a PDEs). Actualmente, disfruto de un contrato Serra Húnter en la UPC. En total he impartido más de 350h de clase, 6 TFGs, 1 TFM y actualmente estoy co-dirigiendo desde octubre de 2022 una tesis doctoral en la prestigiosa ENS.

Todas estas experiencias conforman lo que soy a día de hoy: un investigador multidisciplinar capaz de estudiar de forma teórica y computacional problemas de teoría clásica de sistemas dinámicos pero a la vez, preparado también para, gracias a la teoría y métodos numéricos aprendidos como postdoc, trasladar junto con una sólida y variada red de colaboradores, estas ideas al contexto estocástico y de las aplicaciones. A esto cabe sumar un docente con clara vocación de despertar y guiar los intereses científicos de jóvenes talentos.

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| **Área Temática:** | Ciencias matemáticas |
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| **Título:** | Almost impossible structures |

**Resumen de la Memoria:**

I research pure mathematics, mostly applying tools of logic to questions in group theory, topology and set theory. I was awarded a PhD in 2016 by Vanderbilt University under the advisement of Mark Sapir. I am currently Maria Zambrano Postdoc at UPV/EHU (while here I had a nearly 4-month stay at the Fields Institute). Before this I was a Heilbronn Research Fellow at the University of Bristol. Before that, I was a Severo Ochoa postdoc at ICMAT in Madrid, and before that was a postdoc at University of the Basque Country.

I have given 56 talks across 10 countries (including the US, Canada, Ireland, UK, Spain, France, Germany, Slovenia, Austria, and Poland). I have 21 accepted papers and 5 submitted preprints. My research includes solutions of very old questions. For example, the following probably dates back to the 1960s "Do there exist groups of arbitrarily large cardinality whose proper subgroups are of strictly smaller cardinality?" I show that indeed such groups exist. Recently, with Olshanskii and Varghese, we construct such a group which has further unusual properties (every descending chain of subgroups is finite, every action on a metric space has bounded orbits). Also, I proved the 40-year-old Infinite Edge Orbit Conjecture of Laszlo Babai. Other results include the creation of universes of set theory in which perverse things happen (to obtain so-called independence theorems). One such universe has a metric space which is not paracompact; another has a locally free group which does not have a left-invariant order.

Part of my current research line is the production of further examples of unusual objects, but which will be of a smaller scale. For example, it has been asked whether there exist groups whose spread is exactly equal to 1 (and it is known that finite groups cannot have spread equal to 1). Another question which likely has an affirmative answer is whether there exists a left-orderable group which satisfies a law and is not solvable.

Other current questions regard uncountable objects. For example, it was asked in the 1960s whether there exists a lattice whose every proper sublattice is of strictly smaller cardinality. Only some cases are known so far, but the general question remains wide open. A different question is from abelian group theory: If A is the aleph_1 power of the integers modulo the sequences which are eventually zero, then does A have a direct summand which is neither 0 nor equal to A? This particular question was asked in the 1980s and appears in the Kourovka notebook.

Still another line of research is slightly closer to applied mathematics. If X is a compact space and we put a man at point M and a lion at point L and then allow them each to move simultaneously at speed 1, then is it the case that either the lion has a strategy for eventually catching the man or the man has a strategy for always avoiding the lion? A solution is known if one only allows this game to last for finite time (the proof is nonconstructive).

An additional problem in which I am interested is in finite combinatorics. If one has a nonempty collection of finitely many sets, and the collection is closed under taking unions, then is it the case that there exists at least one point which is in at least half of the points of the collection? This is the famous "Open Union Conjecture" and dates back at least to 1980.

**Resumen del Currículum Vitae:**

I am a researcher in pure mathematics. I graduated from Brigham Young University Magna Cum Laude with a GPA of 3.98, being awarded the Orson Pratt Award (outstanding graduating senior) as well as membership in Phi Kappa Phi, National Society of Collegiate Scholars, Golden Key Society, and Phi Eta Sigma. I then completed a Master in Science there, receiving the Graduate Student Service Award, and as an instructor had a perfect 8/8 student review during a semester. I was awarded a PhD in 2016 by Vanderbilt University under the advisement of Mark Sapir. During the PhD studies, I was the recipient of the University Graduate Fellowship (an extra 10.000 USD per annum).

I am currently Maria Zambrano Postdoc at UPV/EHU (this post has included a 3.5 month stay at the Fields Institute). Before this I was a Heilbronn Research Fellow at the University of Bristol. Before that, I was a Severo Ochoa postdoc at ICMAT in Madrid, and before that was a postdoc at University of the Basque Country. My research focuses on the interactions of group theory, topology and set theory. The research includes collaborations with Saharon Shelah Alexander Olshanskii, Ilya Kazachkov, Oleg Bogopolski, Greg Conner, Olga Varghese, Sam Hughes, Philip Moeller and Wolfram Hojka. I have 21 accepted publications, 9 of which are in Q1 journals. I was an organizer of University of Bristol algebra seminar and an organizer of the GTA: Gran Bilbao conference.

My mathematical career has also included many semesters of teaching undergraduates (6 semesters of calculus, 1 of trigonometry) and also a semester teaching graduates (advanced geometry). Professional development also includes refereeing for numerous journals (including Crelle's Journal; Groups, Geometry and Dynamics; Journal of the London Mathematical Society; Journal of Algebra and others). Professional visits have been made to Hebrew University (with Saharon Shelah), University of Dusseldorf (with Oleg Bogopolski), University of Ljubljana (with Petar Pavesic), University of Munster (with Olga Varghese) and also an almost 4 month stay at the Fields Institute. I have given more than 50 conference and seminar talks across 10 countries. Some solutions to open questions, obtained recently in my research, are listed below.

A positive solution to a question which probably dates at least back to the 1960s: Do there exist groups of arbitrarily large cardinality whose proper subgroups are of strictly smaller cardinality?

Proved the 40-year-old infinite Edge Orbit Conjecture of the famous combinatorialist Laszlo Babai (the finitary version was already proved in 1993).

Question asked by Good, Tree, and Watson in the 1990s: Does the famous theorem (of A. H. Stone) that metric spaces are paracompact follow from the ultrafilter lemma? No, there exists a universe of set theory in which the ultrafilter lemma is true and Stone's theorem is false.

Question of J. W. Cannon and G. R. Conner from the early 2000s (popular in wild topology): Is the fundamental group of the harmonic archipelago isomorphic to that of the Griffiths space?
Yes.

Question of Y. de Cornulier (2006): Does there exist a group of cardinality aleph_1 whose actions on metric spaces are essentially trivial? Yes (answered in a joint paper with the famous Saharon Shelah).

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| **Área Temática:** | Ciencias matemáticas |
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| **Título:** | Interactions between Fourier analysis and the mathematical theory of turbulence |

**Resumen de la Memoria:**

I am a postdoctoral research associate at the University of Massachusetts Amherst. Before that, I got my PhD at BCAM and UPV/EHU in 2020.

My work lies broadly within the analytic study of the mathematical theory of turbulence. I have focused on the relationship between the evolution of vortex filaments, which are related to the Schrödinger equation, with irregular phenomena like Riemann's non-differentiable function and the Talbot effect. In this setting, I have studied the multifractality and intermittency of these objects, as well as the geometric structure of Riemann's function and the derivation of the Schrödinger-Talbot effect from the Helmholtz equation. I have also worked on the pointwise convergence problem for the Schrödinger equation, a classic problem in Harmonic Analysis. In the fractal case, I gave the current best existing lower bounds for the Sobolev exponent, both in the periodic and Euclidean settings.

In my research project for this RyC, I propose push this interaction bewteen Fourier analysis and turbulence further. In particular, I want to implement a probabilistic component, motivated by the great advances that have recently been achieved in wave turbulence theory for dispersive equations exploiting probabilistic and combinatoric techniques. I propose four big lines of research:

1. A rigorous study of intermittency and multifractality. Both these properties are ubiquitous in experiments, but we still do not understand them well from a mathematical perspective. I aim to rigorously them in the setting of the binormal flow, a model for vortex filaments coming from Euler and directly related to the Schrodinger equation and Riemann's function.

2. Kinetic theory for dispersive equations. Very recently, the Wave Kinetic Equation for the power NLS has been rigorously derived using deep probabilistic and combinatoric techniques. I want am currently learning these techniques and I want to apply them to other dispersive models like the Hartree NLS.

3. Fourier analysis problems from a probabilistic perspective. The success of thesee probabilistic methods in dispersive PDE suggest that we may be able to use them for classic problems in Fourier Analysis like the Schrödinger pointwise convergence problem. The idea is that if we ask a property to hold for almost all functions in a space, then we can be less restrictive in the space we need. I want to use the new Random Tensor theory ansatz to improve the deterministic exponent that is known for the power NLS convergence problem.

4. Rigorous derivation of the Talbot effect from the Helmholtz equation. I established the Talbot convergence from Helmholtz to Schrödinger in a distributional sense. I would like to do it in a stronger functional sense, for which again the probabilistic approach looks promising.

A more detailed account of my research proposal is included in attached application.

**Resumen del Currículum Vitae:**

I am a Simons postdoctoral research associate at the University of Massachusetts Amherst.

I have written 10 research articles that have been published in journals like Advances in Mathematics, Analysis & PDE, Transactions of the AMS, SIAM Journal on Mathematical Analysis and J. of Math. Analysis and Applications. I have written an additional article in La Gaceta de la RSME and two in TEMat.
During my postdoc in the US, I have been invited to deliver seminars in prestigious venues like UChicago, Brown, UWashington, Duke, GeorgiaTech, Beijing, and Paris-Est Créteil. During my PhD I also gave seminars at Sorbonne, ICJ Lyon and Max Planck Leipzig. I have also been invited to deliver talks in conferences in honor of Carlos Kenig and Luis Vega, at a workshop in SNU (Korea), twice in Oberwolfach and in various AMS Sectional Meetings.

I have obtained competitive fellowships like a 2023 Marie Curie Postdoctoral Fellowship from the European Research Agency (165.000€), a 2022 AMS-Simons Travel Grant (6000 $) and an FPU doctoral fellowship. For my graduate work, I was awarded a 2022 Vicent Caselles Prize by RSME. Before that, I got the first prize in Mathematics at Premios Nacionales Fin de Carrera 2015 for my undergraduate studieds.

I am currently a member of the Simons Collaboration on Wave Turbulence, an interdisciplinary collaboration with around 20 PIs in the US and Europe that gathers physicists and mathematicians to study the mathematical structure of wave turbulence.
On the other hand, my current collaborators include V. Banica (Sorbonne), C. Cho (SNU, Korea), R. Lucà (BCAM), A. Nahmod (UMass), G. Staffilani (MIT), C. Sun (Créteil), L. Vega (BCAM,UPV/EHU), X. Yu (Oregon State), H. Yue (Beijing), and I have collaborated with A. Boritchev (Lyon), F. Ponce-Vanegas (BCAM) and V. Vilaça Da Rocha (GeorgiaTech).

I have done a long research stay at ICERM-Brown University (where I started to work with X. Yu).
Short stays include Sorbonne Université (visiting V. Banica), SNU (visiting C. Cho and S. Lee) and ICJ Lyon (visiting A. Boritchev).

I am currently a member of the Scientific Comittee for the Junior Meeting Math-SOMMa 2024. For the year 2023/2024 I organize the Analysis & PDE seminar at UMass. Before that, I organized the LIGHT PhD Seminar at BCAM from 2018 to 2020. Other service to the community includes peer-review of articles for Journal d'Analyse Math., Indiana Univ. Math. J., J. Fourier Anal. Appl., J. Functional Analysis, Non-Linear Analysis and J. Fractal Geometry.

Regarding teaching, at UMass I was the Instructor for the Senior course MATH523 - Intr. to Modern Analysis and the Freshman course MATH132 - Calculus II (240h total). At UPV/EHU I was Teaching Assistant for Calculus I (108h total).

I have engaged in public dissemination of mathematics by delivering public talks (BCAM-Naukas Pi Day 2019, Lemniskata 2020), writing dissemination articles (Elhuyar Aldizkaria-March 2023, UPV/EHU Scientific Culture blog, La Gaceta de la RSME) and giving radio interviews (see my webpage https://sites.google.com/view/deceizabarrena/dissemination for an archive).

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| **Área Temática:** | Ciencias matemáticas |
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| **Correo Electrónico:** | martina.fischetti@gmail.com |
| **Título:** | Counterfactual Analysis for Explicability and Fault Prevention of Complex Energy Systems |

**Resumen de la Memoria:**

Given my previous experience in Mathematical Optimization and Machine Learning (ML) in energy, I intent to use this grant to specialize more on explicability in ML, looking into Counterfactual Analysis for Explicability and Fault prevention of Complex Energy Systems, with possible applications to wind energy, but also solar energy or hydrogen.
This project will contribute to the area by developing new procedures, which will help users to understand the output of Machine Learning (or Deep Learning) methods.

As the complexity of ML algorithms has increased, there has been growing criticisms that algorithms are too opaque (black-box models, as Deep Neural Networks) since understanding their operation is hard and their solutions are difficult to explain and interpret. Consequently, ML algorithms are now requested not only to be accurate, but also explainable and interpretable.

Energy systems are often very complex systems, where different components interact in a not-trivial manner. In this context, identifying faults in the system and especially identifying their reason can be a complex engineering problem. Take for example an offshore wind farm. As offshore wind turbines can be very expensive to reach, faults are very expensive to handle: first because it is expensive to send people at sea, and secondly because in some cases the production of the turbine is curtailed until the maintenance is finished, which could take days in case of bad weather. In addition, there are safety risks associated with shipping people at sea. All in all, it is very important for energy companies to reliably identify real alarms. For this reason, many companies are nowadays using ML to identify failures.
More precisely, given a set of input recorded at the turbine (as for example temperature, oil level, date of last oil change, date of last component repairmen, weather conditions etc.) ML classify the component as "good" or "faulty". We would like to look a step further: we want to understand how the status of the turbine should be changed not to have a failure. This could let to an automatic system that prescribe the minimum cost actions to avoid failure and initiate in automatic the preventive maintenance actions to take. This would be a new application of counterfactual analysis techniques.

Counterfactual Analysis is used, once a classifier has been trained, to identify how records should be changed in their features to being classified in the "good" class. Finding counterfactual explanations amounts to solving a mathematical optimization model, where we want to minimize the number changes (or the total cost associated to changes) to an instance to maximize its probability of being classified as a good instance, subject to different constraints. This line of research will contribute to the state of the art of decision making by creating new explainable ML tools for complex systems using Mathematical Optimization and Statistical methods. It implies research lines like Operations Research (OR) for counterfactual analysis with optimal trees or deep learning and OR for counterfactual analysis with complex dissimilarity functions.

**Resumen del Currículum Vitae:**

During the grant I will work on Machine Learning (ML) combined with Operations Research (OR) in the energy field, with a particular focus on explicability.
I have a vast experience in OR for energy, in particular in renewable energy with a number of research project in offshore wind together with leading scientists in OR and a leading company in the wind sector, and numerous publications and awards in the matter.
In particular during my Industrial PhD I worked with Prof. David Pisinger (who recently won an ERC consolidation grant) and Vattenfall, leading company in the energy sector in North Europe. This project had a huge industrial and scientific impact, as well as social impact.
The developed optimization tools are now deployed in Vattenfall and used to design all new offshore wind farms, proving a huge economic impact. They have been used, among others, also to design the first subsidy free offshore wind farm ever constructed (Hollandse Kust Zuidin the Netherlands). Using my scientific skills for a greener future makes me very proud. The project was very successful also from a scientific perspective: it was selected in the top 6 applications of OR in the world in 2019 (finalist at the prestigious Franz Edelman Award 2019), winner of the EURO Doctoral Dissertation Award, winner of the Erhvervsforskerprisen (Best Industrial Ph.D.) from Innovation Fund Denmark, etc. In the last year of my PhD, I¿ve discovered my interest in applications of Machine Learning together with Operational Research. In this framework,I collaborated both with the Machine Learning division in DTU (DTU Compute), and with the research group GERAD, Polytechnique Montréal, Canada. I have presented my PhD work in different international conferences and published it in different journal papers.
After my PhD I continued working in research and innovation in OR in Vattenfall. As lead engineer, I was tasked with identifying new areas for optimization and to lead the development of optimization tools and research projects. I led different optimization projects within the company, and coordinated internal and external collaborations (for example with Vrije University in Amsterdam, Technical University of Denmark and University of Padova in Italy). I supervised a PhD student and 4 master thesis.
From 2021 I worked as a senior researcher at the Joint Research Center of the European commission in Seville. Here I led a collaboration with academia (University of Pavia) to develop a new heuristic algorithm for multimodal public transport across Europe. I was responsible for facilitating communication, setting direction with our university partners as well as liaising with policy officials and stakeholders in the European Commission Directorates in Bruxelles. The resulting research conferences in Operations Research (ODS 2022, ODS2023, ORAHS23, EWPGR22) and submitted to a journal paper. I supervised a visiting PhD student on Multimodal freight logistics modelling with focus on sustainability and cooperation.

I had different contracts and stays abroad in my career (in particular in Italy, Denmark, Canada, Netherlands, Spain) and have a vast international network both in academia and in industry.

**Resumen de la Memoria:**

My research interests lie at the intersection of algebraic geometry and physical mathematics. One of my main focuses has been on enumerative geometry, which, simply put, is the study of counting problems in geometry. My research contributions to enumerative geometry have been rather interdisciplinary. I have used technical tools inspired by physics, such as the Eynard–Orantin topological recursion, representation theory of W-algebras and integrable systems in order to prove structural results about geometric invariants, which are difficult to obtain using purely geometric tools.

In the next phase of my career, I plan to significantly widen the scope of my work to fields that have not been impacted by this interdisciplinary perspective so far. Ideas from physical mathematics have the potential to solve open questions in fields such as Argyres–Douglas theories in physics, quantum group representations, new non-semi-simple CohFTs on the moduli space of curves and b-Hurwitz theory. I plan to use topological recursion and associated W-algebra techniques to prove deeper structural properties of invariants in these fields, such as the infinite dimensional symmetries captured by integrability. For this purpose, a generalisation of the topological recursion that incorporates a crucial refinement parameter is required, and I plan to develop this new formalism.

Another research direction I have pursued actively is the study of categorical algebraic geometry, which is the study of derived categories of geometric spaces and how they change under various transformations (such as birational transformations). In particular, I have worked on an approach to resolving the famous Bondal–Orlov conjectures by using the notion of windows that originate in string theory. I plan to pursue this further to provide new classes of examples to this conjecture via a deeper understanding of the kernel that furnishes the equivalence.

My research career, spanning 4 different countries so far, has resulted in papers which have been accepted or published in top international journals. My collaborations have been diverse both in terms of geography (including North America, Europe and Asia) and in terms of research field (including geometry, representation theory and physics). My scientific contributions have been recognised by the international community by inviting me to present my work at conferences and seminars at leading universities, supporting my research by providing funding from large grants and by inviting me to review grant proposals and referee articles for top journals.

**Resumen del Currículum Vitae:**

Since 2022, I am a postdoctoral researcher at the University of Edinburgh funded by an ERC starting grant (PI: Alexander Shapiro). Before moving to Edinburgh, I spent 2 years from 2020-2022 as a postdoc at the Max Planck Institute for Mathematics, Bonn. In 2020, I earned my PhD in Mathematics from the University of Alberta, where I was awarded multiple prizes recognising my research achievements (including the Alberta Graduate Excellence Scholarship 2020 and the Josephine Mitchell Prize 2019) totalling €30.816 in the period 2015-2020. Before that, I did my Bachelors in Engineering Physics at the Indian Institute of Technology Madras in my home country of India. Thus, I have demonstrated excellent international mobility, having worked in four different countries (India, Canada, Germany and the U.K.), and during the postdoc phase of my career, I have spent 42 months abroad in different prestigious institutions.

My research program is interdisciplinary and connects geometry, representation theory and mathematical and theoretical physics. A major portion of my research concerns enumerative algebraic geometry, where I employ a powerful tool called topological recursion to understand the rich hidden structure of various geometric invariants. Another key research direction I pursue is in categorical algebraic geometry, using key ideas from string theory. I study derived categories of geometric spaces, what part of the geometry these categories capture, and how they change under geometric transformations (e.g. birational transformations).

I have authored (solely or as co-first author) 10 articles (preprints and publications) listed in my CVA. My publications are published (or accepted) in top international journals, including Advances in Mathematics, Memoirs of the AMS, Transactions of the AMS and Selecta Mathematica. Most of these publications were co-authored with researchers from abroad, and I have 17 collaborators from different disciplines in mathematics and physics based in 8 different countries, which shows my ability to lead groups and multiple lines of research. My research has been funded from large international research projects (including ERC, NSERC and CRC) worth over €150.000 each.

My research has been recognised by the international scientific community. Despite being only 3.5 years out of my PhD, I have given over 25 invited talks in conferences and seminars in 11 different countries and have already been invited to give 5 more in 2024. I have also refereed for top international mathematics journals including Inventiones Mathematicae, Journal of the EMS, Geometry & Topology, Journal of the LMS, Communications in Mathematical Physics and Transactions of the AMS and reviewed grant proposals for the Dutch Research Council (NWO).

I have co-organized 3 international conferences so far: two conferences at the prestigious Banff International Research Station (BIRS) in Canada, and one at the 2020 CMS Winter meeting. Since 2023, I'm also a co-organizer for the weekly Algebra seminar at the University of Edinburgh. Finally, I have plenty of teaching experience as a PhD student and as a postdoc, and experience supervising one Masters thesis during my stay in Bonn.

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| **Área Temática:** | Ciencias matemáticas |
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| **Título:** | Mathematical Analysis |

**Resumen de la Memoria:**

My field of research is at the junction of Harmonic Analysis, PDEs and Geometric Measure Theory. One of my main research topics is the study of the connection of analytic properties (L2 boundedness, existence of principal values, etc.) of a class of singular integral operators arising from the theory of elliptic PDEs (the gradient of the single layer potentials) with the geometric properties of rectifiability and uniform rectifiability.

The main result that I achieved during my PhD was the generalization, together with L. Prat and X. Tolsa, of the celebrated solution by F. Nazarov, X. Tolsa, and A. Volberg [Acta Math., 2014] of the David-Semmes problem in co-dimension 1. In particular, we extended it in the cotext of elliptic PDEs in divergence form with Holder continuous coefficients. This study was also motivated by the application to a one-phase problem for the elliptic measure, and was crucial in a subsequent work [J. Funct. Anal] in which I dealt with related aspects related to a two-phase problem for the elliptic measure. The results in my thesis have later been proved also in more generality in a more recent joint work with A. Molero, M. Mourgoglou, and X. Tolsa under minimal (Dini mean-oscillation type) assumption on the operator.

During my postdoc at UPV/EHU I have also been interested in the study of two-phase parabolic free boundary problems for time-varying domains, which required the development of a blow-up technique and new results in different areas ranging from Heat Potential Theory, Geometric Measure Theory and Optimal Transport. This also naturally served as a motivation for the study of the fine structure of 1-codimensional measures in the so-called parabolic space, which corresponds to the Euclidean space endowed with a parabolic set of (anisotropic) dilations. Together with A. Merlo and M. Mourgoglou, I established the (1-codimensional) parabolic analogue of the celebrated theorem of D. Preiss [Ann. of Math., 1987] that characterized rectifiability of measures via the existence of densities.

More recently, during my current postdoc at the University of Jyväskyla, I have also been interested in the study of Fourier analytic properties of fractal measures. In particular, in a joint preprint with T. Orponen and A. Pyörälä, we were able to use the recent solution of K. Ren and H. Wang of the Furstenberg set conjecture in the plane in order to achieve sharp growth estimate for a proper Lp norm of the Fourier transform of a (Frostman) measure supported on the parabola. This result has both geometric and number-theoretic applications.

I authored 6 publications (3 as a single author) published in well-established journals (including Arch. Ration. Mech. Anal., J. Funct. Anal., J. Math. Pures Appl., Anal. PDE.) and 2 preprints (one of which is set to appear on the arXiv on February 1st, 2024).

**Resumen del Currículum Vitae:**

I obtained a BSc in Physics in 2013 (Thesis: "Weyl quantization and Wick correspondence", advisors: Prof. Paolo Ciatti, Prof. Kurt Lechner, grade 110/110) at the University of Padua (Italy), where I also obtained a MSc in Mathematics in 2015. The master thesis "Lie groups associated with polynomial CR manifolds and their representations" was directed by Prof. Paolo Ciatti (U. of Padua) and Prof. Fulvio Ricci (Scuola Normale Superiore, Pisa), and I obtained the grade 110/110 cum laude. I was also a student at the Galilean School of Higher Education, and I got the diploma in 2016 (100/100 cum laude). To enter the school, I was selected out of 400 participants with both a written and an oral exam.

From January 2016 to December 2019, I was a PhD student at the Autonomous University of Barcelona and BGSMath. I defended the thesis "Singular integrals, rectifiability and elliptic measure" under the direction of Prof. Xavier Tolsa and Prof. Joan Verdera. The thesis was graded 'Excellent cum laude' and obtained the 'Mención Internacional'. The thesis committee was composed by Prof. Xavier Cabré (UPC), Prof. José Gonzalez Llorente (UAB) and Prof. Henri Martikainen (U. of Helsinki).

Since September 2023, I am a postdoc at the University of Jyväskyla (Finland). My current mentor is Prof. Katrin Fässler. Previously, I worked as a postdoc (PIC) at the University of the Basque Country (UPV/EHU) from March 2020 to July 2023 (with two different PIC contracts). My mentor was Prof. Mihalis Mourgoglou. Finally, I am set to start a new job as a Lector at the Autonomous University of Barcelona on Feb 1, 2024.

The research stays that I conducted include a 3 month visit of the U. of Missouri (Feb - May 2019, host: Prof. S. Hofmann). Furthermore, I participated in research programs at ICMAT (May-June 2018) and at the Hausdorff Research Institute for Mathematics in Bonn, Germany (January - February 2022).

I have given more than 25 talks at seminars and conference in Spain, Italy, Germany, Finland, and USA. In particular, I have been an invited speaker at the international conference "Harmonic Analysis and PDES in Helsinki (June 2019) and at a special session of the Nordic Congress of Mathematics (July 2023).

I have been teaching assistant for two courses, including a graduate course in Harmonic Analysis at the University of Jyväskylä (Fall 2023). I was a co-organizer of the joint UPV/EHU-BCAM Bilbao Analysis and PDE seminar (February 2022 - January 2023), and a co-organizer of the International conference "Harmonic Analysis, PDEs, and GMT in Bilbao 2023" (June 12-16, 2023, more than 115 participants).

**Área Temática:** Ciencias matemáticas
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**Título:** Algebraic geometry, singularities, Hodge theory and D-modules

**Resumen de la Memoria:**

Soy coautor de 7 artículos publicados o aceptados, 4 de ellos en revistas indexadas en Q1 en JCR. Destaca entre ellos una monografía de 140 páginas que será publicada en Memoirs of the AMS. Mi campo de investigación está dentro de la geometría algebraica y la teoría de singularidades. Concretamente, en la teoría de Hodge y las aplicaciones de la teoría de D-módulos. Mi trayectoria se puede considerar que está dividida en tres etapas.

En la etapa postdoctoral, mi investigación se ha centrado en la aplicación de la teoría de Hodge a las singularidades. En nuestros últimos trabajos, hemos creado varias construcciones que tienden un puente entre la teoría de estructuras mixtas de Hodge inventada por Deligne y la teoría de recubridores de infinitas hojas de variedades algebraicas lisas. Dentro de esta última se pueden encontrar los módulos de Alexander de una o varias variables, invariantes clásicos de teoría de nudos, que han demostrado ser muy últiles como invariante de singularidades. Nuestros trabajos arroja nueva luz sobre estos invariantes, y nos ha permitido probar resultados estructurales nuevos.

En el futuro, exploraremos hasta dónde llegan las posibilidades de esta teoría, en dos direcciones: por un lado, el desarrollo de técnicas prácticas de cálculo de estos invariantes con su estructura de Hodge, y por otro, la búsqueda de a qué nuevos resultados sobre la estructura de los módulos de Alexander puede llevar esta nueva teoría.

En el doctorado, mi trabajo versó sobre el estudio de ecuaciones en diferencias desde un punto de vista algebraico, con "módulos en diferencias¿, que tienen un papel análogo al que tienen los D-módulos en el campo de las ecuaciones diferenciales. En mi tesis doctoral, definí una noción razonable de las singularidades de una ecuación en diferencias, y demostré que contenía toda la información local que puede existir en un módulo en diferencias. Por otro lado, demostré que existe una transformada de Mellin local, que predice qué singularidades tiene la transformada de Mellin de un D-módulo a partir de las singularidades de éste.

Las ecuaciones en diferencias juegan un papel protagonista en la conjetural q-correspondencia de Langlands. En la correspondencia de Langlands, fue un resultado muy celebrado la descripción de una conexión rígida irregular por Frenkel y Gross. Cabe preguntarse si existe una construcción análoga en el caso de ecuaciones en diferencias. Para definir la rigidez, es necesario definir singularidades, por lo que se requerirían los resultados de mi tesis doctoral.

En el trabajo de fin de máster, trabajé sobre dessins d'enfants. Estos son objetos combinatorios inventados por Grothendieck, que codifican curvas algebraicas y permiten, en principio, estudiar el grupo de Galois de los números racionales, a través de su acción en el conjunto de dessins. En mi trabajo de fin de máster di el primer ejemplo de un dessin d'enfant regular que no está fijo por el subgrupo derivado del grupo de Galois. El ejemplo vive en una curva de género 61, pero se puede escribir de manera completamente explícita.

**Resumen del Currículum Vitae:**

Actualmente soy profesor ayudante doctor en la Universidad Autónoma de Madrid.

Durante mis años preuniversitarios, participé en numerosas competiciones científicas, especialmente matemáticas, obteniendo muy buenos resultados. Hasta 2023, me encuentro entre tan sólo 6 españoles que han participado tres veces en la Olimpiada Internacional de Matemáticas, y entre 8 que han obtenido una medalla de plata.

En el Grado en Matemáticas obtuve una nota media de 9,47, 121,5 créditos con matrícula de honor y el tercer premio en los Premios Nacionales de Fin de Carrera. Completé los estudios de grado en tan sólo 3 años. Además, durante estos años colaboré con la revista Matgazine: esta era una revista de divulgación hecha por y para estudiantes universitarios de matemáticas. En 2012 disfruté de una beca JAE Intro CP en el ICMAT bajo la supervisión de Andrei Jaikin, trabajando en grafos expanders.

En el curso 2013-14, cursé el Máster Universitario en Matemáticas y Aplicaciones en la Universidad Autónoma de Madrid, con una ayuda parte del programa Posgrado de Excelencia Internacional de la misma. Obtuve una nota media de 9,65. Realicé un trabajo de fin de Máster sobre Dessins d'Enfants, bajo la dirección de Andrei Jaikin.

Obtuve una beca de la fundación "la Caixa", y completé el programa de doctorado de la Universidad de Wisconsin, el 16º departamento de matemáticas más prestigioso del mundo según el ranking ARWU de 2023. Durante mi doctorado trabajé bajo la supervisión de Dima Arinkin, y realicé una tesis doctoral sobre ecuaciones en diferencias desde un punto de vista algebraico.

Al finalizar el doctorado, en 2019 obtuve un contrato postdoctoral de tres años en la Universidad Estatal de Luisiana, bajo la supervisión de Daniel Sage. En 2021 obtuve el proyecto individual AMS-Simons Travel Grant que conceden la AMS y la fundación Simons a investigadores jóvenes. En 2020 se concedieron 78 ayudas a nivel nacional (en EE UU). Obtuve un contrato Margarita Salas en la UAM que comenzó el 1 de enero de 2022.

Soy coautor de 7 artículos publicados o aceptados, 4 de ellos en revistas indexadas en Q1 en JCR. Destaca entre ellos una monografía de 140 páginas que será publicada en Memoirs of the AMS.

En las universidades de Wisconsin, Luisiana y Madrid, he sido profesor ayudante de 3 asignaturas y profesor único de 10 asignaturas. El formato ha variado entre clases teóricas y clases con un enfoque práctico e interactivo, pasando por clases que mezclan ambos formatos. Mis tareas han incluido impartir clases teóricas y de problemas; preparar los contenidos de ambas; escribir exámenes; tener horas de tutoría; asignar tareas y corregir exámenes.

Durante la carrera, dirigí el equipo de alrededor de 20 personas de la revista Matgazine. Durante 2 años y medio organicé el seminario de geometría algebraica de doctorandos en la Universidad de Wisconsin, y más tarde el congreso internacional Singularities in the Midwest. También colaboré con la División de Diversidad, Equidad e Inclusión para mentorizar a tres estudiantes en sus estudios. He dado dos charlas de divulgación a adolescentes como parte del "Math Circle" organizado por la Universidad de Wisconsin. Actualmente soy uno de 3 organizadores del Pequeño Instituto de Matemáticas, una actividad semanal a la que acuden alrededor de 150 alumnos de secundaria.

**Área Temática:** Ciencias matemáticas
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**Título:** Model theory, classification and wild geometries

**Resumen de la Memoria:**

Model theory is the study of mathematical structures (groups, fields, graphs, lattices...) through the definable sets, i.e. sets defined by a first-order formula (in the sense of first-order logic). A major modern success in model theory is its identification of several notions of tameness for mathematical first order structures. The drawing of dividing lines and the affiliation of each mathematical structure to a specific class (stable/NIP/NTP2/NSOP1...) constitute what model theorists call Shelah's classification landscape. My research concerns model theory and can be decomposed in four research lines.

Research line 1: Generic expansion of structures classification, NSOP1 and wild geometries. It involves new techniques to approach the model theory of structures usually deemed wild, in order to both construct new examples of structures and study their model-theoretic properties. Part of this research program was recently awarded an MSCA Individual Fellowship with the high score of 95.8%.
This research line is the most accomplished of the four. It has been the terrain of numerous collaborations (with 4 co-authors) and publications (6). For instance, the construction of generic additive subgroups of algebraically closed fields of positive characteristic (ACFG) is an early and meaningful algebraic example of an NSOP1 theory, (one of the pivotal area in model theory today) and its study involved new technics for handling wild geometries.

Research line 2: Generic nilpotent groups and Lie algebras. This recent direction constitute a very promising set of research projects on the long term. The collaboration with Müller, Ramsey and Siniora was awarded a research stay at the Institut Henry Poincaré in Paris for the soundness and pertinence of our research perspectives, and led to an important recent paper. It involves techniques from model theory, probability, geometric group theory and descriptive set theory, and has connections to other fields such as statistical mechanics and quantum group theory. It is an innovative project which is built around the idea that the model theory of nilpotent groups is now accessible with modern methods, which was not the case ten years ago.

Research line 3: Classification and dp-minimality in structure. Shelah's conjecture is a leading question in model theory, it states that an NIP infinite field is either real-closed, algebraically closed or admit a non-trivial Henselian valuation. Far from being solved, this conjecture has generated a wide and fruitful research trend which is a meeting point for model theory, algebraic geometry and the theory of valued fields. In this research line, I investigate dp-minimal integral domain (in line with Shelah's conjecture) and dp-minimal expansions of the integers, with success in both approach and an ongoing full classification of dp-minimal integral domains in collaboration with Halevi and Johnson.

Research Line 4: enriching a stably embedded predicate. In this collaborative research line (4 co-authors), we developed an ad-hoc method for answering open questions on expansions of the integers, which led to a general setting where we encode the structure on a stably embedded definable set (which we call an "enrichment"). For instance, we produce the first
example of a strictly stable expansion of the group of integers, a question previously
asked by Conant.

**Resumen del Currículum Vitae:**

Less than five years after my PhD, I have developed all the essential components of a leading and productive research methodology.
I possess a substantial set of publications (7) and preprints (5) published or to be published in the best journals in model theory (Journal of Mathematical Logic, Annals of Pure and Applied Logic, Journal of Symbolic Logic) as well as general mathematics journals (Israel Journal of Mathematics and the prestigious Journal of Algebra). This not only demonstrates my commitment to high-quality research outcomes, but also showcases independence (five are single-authored) and flair for collaboration (twelve co-authors, none of them my PhD advisors). The prestigious research grants I have secured (MSCA postdoctoral fellowship, IHP `Research in Paris'), my robust international network and my numerous collaborators indicates that my profile attracts both funding and resources for leading and implementing research projects. My participation in numerous conferences (30) as an invited speaker (9) or attendee, ranging from prestigious international conferences (Oberwolfach, BIRS, as invited speaker) to local seminars (26 seminar talks) is a guarantor for a healthy collaborative network, bolstered by multiple invited research stays (6) I have (or will soon) undertake. My past visit to BCAM in Bilbao and my upcoming visit in February 2024 at the UPV/EHU, invited by Kazachov and Casals-Ruiz in Bilbao and at La Complutense in Madrid, invited by Palacin and Baro highlights my openness for new collaborative perspectives with the Spanish research community.

I have engaged in diverse teaching activities, at the undergraduate level (Bonn, Lyon), at an advanced level (Neostability in Bonn),
at a specialized level (mini-course in Leeds) and broader mathematical audience (Course in BCAM), which attest to my ability to disseminate knowledge effectively and adapt to various audiences.

My academic background is both international and of high quality. After completing my undergraduate and PhD studies in France (at the Institut Camille Jordan in Lyon, hosted part-time at the esteemed Ecole Normal Superieur in Paris), I held postdoctoral positions in three prestigious institutes: the Einstein Institute (Jerusalem), the Fields Institute (Toronto) and the Mathematical Institute of Bonn. My work on generic expansions [8],[9],[2] (in the publication list below) is well-known in the recent development of NSOP1 theories, a pivotal area within Shelah's classification theory in recent years. In Jerusalem I was co-advisor of Leor Neuhauser's master thesis, whose subject extending my prior work on generic expansions, leading to two publications [5],[6]. At the Fields Institute, a collaboration with four co-authors [4] answered several open questions on tame expansions of the group of integers. With Prof. Hieronymi, I have undertaken the supervision of a PhD student, Leon Chini, whose works on extending my results in [2] to the

o-minimal context already shows promising results. I was an organizer of the Fields Model Theory Seminar, where the interaction with many of the researchers significantly strengthened my range of collaborators. In Bonn, I was a member of the Hausdorff Center for Mathematics -- a Cluster of Excellence, and benefit from numerous research activities and the proximity to the Max Planck Institute.

**Área Temática:** Ciencias matemáticas
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**Título:** Deterministic and stochastic problems arising in geophysical fluid dynamics

**Resumen de la Memoria:**

En 2019 defendí mi tesis doctoral bajo la supervisión de Antonio Córdoba en la Universidad Autónoma de Madrid. La tesis fue calificada como suma cum laude y mención internacional. Luego realicé una estancia postdoctoral de 6 meses en el Instituto de Ciencias Matemáticas dentro de Laboratorio Kari Astala. Con el fin de ampliar mi movilidad internacional, obtuvo un contrato postdoctoral de dos años ofrecido por la prestigiosa Fundación Alexander Von Humboldt en la Universidad de Bonn. Actualmente, soy investigador Juan de la Cierva en la Universidad de La Laguna.

Mi trabajo de investigación se centra en un amplio área: el análisis de ecuaciones diferenciales parciales no lineales deterministas y estocásticas. La parte principal de mis intereses se centra en los resultados de regularidad local y global para ecuaciones relevantes que surgen en geofísica y dinámica de fluidos.

He publicado 16 (más 4 preprints bajo revisión por pares disponibles en el repositorio arXivs) artículos de investigación. 12 de mis artículos se encuentran en Q1 (JCR) y 5 de ellos en D1 (JCR). Mi trabajo ha sido citado 157 veces según Google Scholar. A continuación, describo brevemente las principales contribuciones y la relevancia de mi trabajo de investigación. Para ello divido mis aportaciones en tres líneas de investigación.

Regularidad de soluciones en ecuaciones de mecánica de fluidos. En colaboración con A. Córdoba (ICMAT) y A.D. Martínez (UAM) durante mis estudios de doctorado vario resultados de regularidad crítica para la ecuación cuasi-geostrófica de superficie. La mayor parte de estos resultados se publicaron en una serie de tres artículos publicados en la prestigiosa revista Advances in Mathematics. Asimismo, en colaboración con el A. Bethencourt determiné la estabilidad y existencia de soluciones de un modelo atmosférico incompresible publicado en Physica D: Nonlinear Phenomena. Más recientemente, también he trabajado en el llamado problema de Muskat, que estudia la evolución de una onda interna entre dos fluidos diferentes en un medio poroso. Este trabajo se ha publicado en Nonlinearity.

Física del plasma. Las aplicaciones de la física de plasmas son múltiples y se dividen en dos grandes áreas: la fusión nuclear y la astrofísica de plasmas. El objetivo que he perseguido es investigar la dinámica de los plasmas confinados magnéticamente y sus propiedades analíticas desde una perspectiva matemática. He realizado contribuciones que se han publicado en Mathematischen Annalen, Journal of Differential Equations, Applied Mathematical Letters y en la revista interdisciplinar Water Waves como autor único.

Ecuaciones diferenciales parciales estocásticas. La comprensión rigurosa de la turbulencia y cuestiones afines en hidrodinámica se considera uno de los problemas más importantes de las matemáticas del último siglo. En colaboración con el grupo liderado por D. Holm y C. Rohde he investigado el mecanismo de la estocasticidad para comprender el problema de la turbulencia. Como fruto de esta fructífera colaboración, he publicado varios resultados relevantes en diferentes revistas como Journal of Statistical Physics, Journal of Differential Equations, Journal of Nonlinear Science (2x) y Nonlinear Differential Equations and Applications.

**Resumen del Currículum Vitae:**

A continuación, paso a resaltar las contribuciones más relevantes de mi CV de forma esquematizada:

1) He publicado un total de 16 artículos de investigación (y 4 preprints bajo revisión por pares disponibles en el repositorio arXivs). Las publicaciones han sido aceptadas en revistas de alto impacto y reconocidas en el área como: Advances in Mathematics, Mathematischen Annalen, Journal of Differential Equations, Journal of Nonlinear Science, Proceedings of the AMS, Nonlinearity, Annales de l'Institut Henri Poincaré, entre otras.

2)Fuí galardonado en 2020 con el premio Vicent Caselles que conceden la Real Sociedad Matemática Española y la Fundación BBVA para jóvenes matemáticos españoles destacados (menores de 30 años).

3)He presentado parte de mi investigación en más de 25 seminarios y congresos internacionales y nacionales. En particular, en instituciones como el Instituto Max Planck, el Instituto del Centro Hausdorff de Matemáticas, la Universidad de Lund, el ICMAT, la Universidad de Barcelona, la Universidad de La Laguna, la Universidad de Oslo, la Universidad del Líbano, etc.

4)Durante mi etapa predoctoral, realicé 4 meses de estancias en la Universidad de Bonn y en el Courant Insitute bajo la supervisión de Juan J.L. Velázquez y Vlad Vicol, respectivamente.

5)He sido organizador de conferencias internacionales y sesiones especiales como: Haussdorf School of Mathematics, Oberwolfach, RSME Bienal 2024, RSME jóvenes 2023, entre otros. Además, también he organizado seminarios de investigación PDE in the Sciences (2021-2022) y Seminario para estudiantes de doctorado (2021-2022) en la Universidad de Bonn. En 2024, seré co-organizador de un mini-symposio en el European Congress of Mathematics celebrado en Sevilla.

6)He sido IP de 3 proyectos autonómicos con presupuestos de 6000€, 4000€ 8000€ respectivamente, para realizar proyectos de investigación como también organizar conferencias internacionales. Por otro lado, también soy miembro del un proyecto nacional (activo) PID2022-141187NB-I00 "AMAED".

7)He co-dirigido 3 tesis de master internacionales en la Universidad de Bonn y dos tesis de grado en la Universidad de La Laguna. Además, he realizado alrededor de 500 horas de docencia en la Universida de Bonn, Universidad Autónoma de Madrid y la Universidad de La Laguna. La docencia ha sido en distintos niveles, tanto de máster como de grado en matemáticas (y otros grados).

8) He realizados trabajos de referee para revistas de alto prestigio como: Archive for Rational Mechanics, Nonlinear Analysis, Journal of Nonlinear Science, Journal of Differential Equations, Asymptotic Analysis, Physica D, Nonlinearity, Journal of Mathematical Physics, Proceedings of the Royal Society A.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | LIÑEIRA SÁNCHEZ, ROBERT |
| **Referencia:** | RYC2023-042896-I |
| **Correo Electrónico:** | robertlineira@gmail.com |
| **Título:** | Public Opinion and Voting in Multi-Level Democracies |

**Resumen de la Memoria:**

I work on public opinion and political behaviour, particularly, on issues related to territorial questions. My research has been related to three main topics: voting in multi-level contexts, preferences about the territorial constitution in multi-national polities, and referendum vote choice. I have conducted most of my research using observational and experimental quantitative data, mainly from survey studies.

Voting in multi-level contexts is a line of research that started with my PhD dissertation. I have dealt with questions related to second-order effects (do voters think in national or regional politics when deciding their regional elections vote), attributions of responsibility (how voters attribute credit and blame in federal systems), and dimensions of electoral competition (left-right vs national positions). My articles in Party Politics, Political Science Research & Methods, Political Behavior (2018), Publius, South European Society & Politics, and Regional & Federal Studies deal with these questions. My participation as a Research Fellow in the "Scottish Election Study" also belongs to this line of research.

The analysis of constitutional preferences also started with my PhD dissertation. I have studied individual-level determinants of constitutional preferences mostly, but not exclusively, in the contexts of Spain and the UK. My dissertation analysed preferences on the territorial organization of the state in Spain and the variation of these preferences across regions, time, electorates, and generations. It was published by the CIS and awarded the XII Best Book prize by the Spanish Political Science Association.

I explored similar issues in the UK context through my participation in the research project "The Constitutional Future of Scotland and the UK"— which analysed different aspects of the UK territorial governance in the context of the Scotland independence referendum. Participating in the "Future of England Survey" and "Smith Commission Survey" projects, I explored constitutional preferences, attitudes towards territorial politics, and attitudes towards territorial redistribution in England, Wales and Scotland. My articles in JCMS, Politics & Governance, three articles in Political Quarterly, and several book chapters rely on data drawn from these surveys.

Referendum voting and attitudes towards referendums constitute my most recent research line. My participation in research projects related to the Scottish independence referendum brought together my interests in constitutional preferences and voting. We obtained funding for different panel surveys related to Scottish independence and the Brexit referendums. I used this data to publish an article on risk attitudes and support for independence in Political Behavior (2019).

I have been the Principal Investigator of a project on voting in referendums financed by the Ministry of Science. I have also been involved as a researcher on several projects and public opinion studies financed by the UK Economic and Social Research Council (ESRC) to study attitudes towards territorial governance, territorial politics and constitutional preferences, as well as other projects on political attitudes financed by the Spanish Ministry of Science.

I have obtained the R3 certificate as an established researcher issued by the Spanish State Research Agency (AEI).

**Resumen del Currículum Vitae:**

I am Lecturer in Politics (tenured) at the University of Glasgow. Previously, I was Assistant Professor (Ayudante Doctor) at the Autonomous University of Madrid (2018-19), Research Fellow at the University of Edinburgh (2014-17), and Adjunct Professor (Asociado) at the Autonomous University of Barcelona (2008-13). I hold a PhD in Political Science from the Autonomous University of Barcelona (2012).

I have published in the top journals of my research fields, political behaviour and multi-level politics: Political Behavior, Party Politics, Political Science Research & Methods, Journal of Common Market Studies, Publius, and South European Society & Politics, among others. The monograph that resulted from my PhD dissertation was published by the Centro de Investigaciones Sociológicas and was awarded the 2015 Best Book prize of the Spanish Political Science Association (AECPA). I have also published 10 book chapters in publishers such as Oxford University Press.

I have been the Principal Investigator of the research project "Referendum Democracy: Public Opinion and Voting in Comparative Perspective" financed by the Spanish Ministry of Science. As a researcher, I have been involved in several projects and studies funded by the UK Economic and Social Research Council (ESRC) such as the "Risk & Constitutional Attittudes", which studied the Scottish independence referendum, the "EU perceptions and the Vote" which analysed the Brexit referendum, and the "Scottish Election Study" that analysed the 2016 Scottish Parliament elections. I have also been a researcher in several projects financed by the Spanish Ministry of Science.

I regularly present my work at international and national conferences (APSA, MPSA, ECPR, EPSA, AECPA, PSA, EPOP) and I have been invited to present my research by different institutions such as the Cabinet Office of the UK government, the University of Minnesota, the University of Leuven, and the Parliament of the German-speaking Community in Belgium.

I have obtained the research certificate R3 as well as various competitive scholarships: ESRC Research Fellowships (2014-15; 2016-17), Juan de la Cierva-Incorporación and Beatriu de Pinós post-doctoral grants in 2018 (both desisted), and a pre-doctoral grant from the Fundación Ramón Areces (2004-07).

I belong to different research groups. I am also an Associated Fellow of the "Centre on Constitutional Change" at the University of Edinburgh (directed by Michael Keating), and a member of the "Democracy, Elections and Citizenship" at the UAB (directed by Eva Anduiza). I am also a member of different political science societies (APSA, MPSA, EPSA, PSA).

I have reviewed research projects for the "Agencia Estatal de Investigación" and political science journals such as the British Journal of Political Science, European Journal of Political Research and Political Science Research & Methods, among others.

I have a long and wide experience in lecturing at the undergraduate and postgraduate levels at the universities of Glasgow, Autònoma de Madrid, Edinburgh, and Autònoma de Barcelona. I have taught courses on political behaviour, quantitative methods, comparative politics, and political science.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | VETTA , THEODORA |
| **Referencia:** | RYC2023-044674-I |
| **Correo Electrónico:** | vettadora@yahoo.com |
| **Título:** | Decarbonization and Green Energy Transition |

## Resumen de la Memoria:

Based on 5-year ethnographic fieldwork, I developed 3 lines of research, combining the advances of political and economic anthropology with human geography, political ecology and comparative method.

1. Post-socialist Democratization and State-restructuring

Starting from my Ph.D at École des Hautes Etudes en Sciences Sociales and through my Marie Curie and Swedish Institute fellowship, I studied the associational revolution in the Balkans, their dialectical constitution with global political economy of aid, neoliberal state restructuring and shifting post-Cold War hegemonies. I focused on the rising nationalism and authoritarian politics, placing its roots in the material/symbolic dispossession of deindustrialization and market "transition" rather than at identity quests or cultural predispositions. I theoretically challenged the dominant dichotomous model of NGO–state clash within Political Sciences, drawing instead social conflict between a cosmopolitan expert elite and precarious labor in service provision. Finally, I challenged the global standardization of aid solutions and their pronounced apolitical nature. I argued that "building civil society" entailed an NGOization of social conflict, a state-devolution to nonelected groups, and a moral dismissing of entitlements.

2. Crisis and austerity in South Europe

Within the ERC Grassroots Economics Project project, I studied the impact of financial crisis and structural adjustment policies on social reproduction, highlighting both the uneven geographical development of the European model and the deep regional disparities within it. I built a critical theoretical dialogue between Polanyi, Gramsci, and E.P Thompson's concept of Moral Economy, challenging binary views of the market as a boundless realm penetrating previously untainted moral spheres. I studied the restructuring of the public sector through labor casualization, bondage regimes of unemployment and entrepreneurial "start-up" initiatives, rescaling governance, depoliticizing citizenship and prompting social fragmentation. Furthermore, I analyzed the penetration of finance capital both in the sphere of production (focusing on the Greek construction sector) and in the sphere of circulation (studying over-indebted households). I addressed the growing juridization of default and theorized upon the mediating role of the state through the implementation of housing policies.

3. Decarbonization and renewable futures

My current work focuses on the interface of austerity and ecological de/valuation in southern Europe. It addresses, first, the ways current shifts in regimes of accumulation and regulation entail the conjoint production of nature and labor; and, second, the ways that the unequal distribution of ecological risks, rights and benefits inform a variety of conflicts, shaping the conditions of possibilities for acting and imagining an ecojust future. Within the research projects I lead, I addressed the multiple processes of privatization and financialization of the Greek energy sector (following EU imperatives and metabolized by fast-track policies) and pointed to the contradictory nature of public power companies within each historical capitalist moment. I now analyze mega and petty solar projects and energy cooperatives, pointing to complex processes of financial expropriation and land-grab, rather than proclaimed energy inclusion

## Resumen del Currículum Vitae:

I am a contracted Distinguished Researcher (R3 certificate) at the University of Barcelona (2023-6). I graduated in History and Archaeology from Aristotle University and received my MA & PhD in Social Anthropology from École des Hautes Etudes en Sciences Sociales in Paris. I previously had a Juan de la Cierva Incorporacion contract (2020-3) and a postdoctoral position in the European Research Council Advanced Grant "Grassroots Economics" (2015-8).

The high quality of my research is evidenced in my track record of publications, the majority of them being single-authored. I have 430 citations and H-index 7 and all publications are in peer-review international journals (Antipode, FOCAAL, Capital Nature Socialism, Anthropological Theory, Social Anthropology etc.) or prestigious edition houses (Berghahn Books, Maison des Sciences de l'Homme, Pluto Books London, Palgrave etc.).

I have a highly international profile. I studied/worked in 7 universities in 6 countries: Aristotle University, École des Hautes Etudes en Sciences Sociales, Central European University, Lunds University Sweden, University of Belgrade, University of Barcelona, Panteion University Athens. Apart from my ERC contract, I was a Marie Curie Fellow at the 2006-2010 "East meets West Project", a partnership of University College London, Central European University, Max Planck Institute and Goldsmiths. I was associate researcher at an Amsterdam Institute for Social Science Research project, and participate in the activities of two Spanish I+D+i projects. I gave invited lectures in 8 universities and participated in more than 30 international conferences in France, England, Italy, Slovenia, Greece, Sweden, Estonia, USA, Croatia, Germany, Hungary, Spain, Romania, Austria, Scotland, Portugal, and Cyprus. Finally, I am member of prominent networks: Commission on Global Transformations (International Union of Anthropological and Ethnological Sciences); the Peace and Conflict and Economic Anthropology networks within European Association of Social Anthropologists; the Interest Group on NGOs and Non-profits within the American Anthropological Association.

My independence and leadership skills are illustrated by the 10 contracts/grants I achieved from: Centre Régional des Oeuvres Universitaires et Scolaires de Paris, Leventis Foundation Switzerland, Swedish Institute, Ministry of Serbia, Marie Curie Fellowship, Juan de la Cierva Incorporacion, Greek Ministry Education, École Française d'Athènes, Independent Research Fund of Denmark. I acquired crucial management-coordination skills within the ERC project I worked, and successfully co-organized 4 international workshops and 4 conference panels in top international associations. I am now developing my own line of investigation and won two competitive projects as a PI and Co-PI: Energy Transition as Ecological Distribution (Greek Ministry of Education 2020-2022) and Frontlines of Transitions (Independent Research Fund of Denmark 2023-2026).

I successfully taught 5 courses on undergraduate and MA levels at Lunds University and University of Barcelona I supervised 4 graduate theses (TFG), 1Master thesis, and was at the tribunal of 2PhD and 1MA thesis.

I am Co-Editor at Focaal–European Journal of Anthropology, a Q1 peer-reviewed international journal, and last but not least, a founding and active member of the European PreAnthro Union.

**Área Temática:** Ciencias sociales
**Nombre:** ZUCCOTTI , CAROLINA VIVIANA
**Referencia:** RYC2023-045128-I
**Correo Electrónico:** carolinaviviana.zuccotti@uc3m.es
**Título:** Unequal chances: the interplay of social, migrant and urban inequalities

**Resumen de la Memoria:**

My research lies in the intersection of three key areas: i) inequality, social stratification, and mobility; ii) migration and ethnicity; and iii) urban studies. A big part of the work that I have done is based in the UK, a country where these topics can be explored with much detail. My work on ethnicity, social mobility and labour market outcomes, for example, have made several contributions: first, it has added evidence to how ethnic inequalities vary across groups, and show that two of the most disadvantageous groups who are often studied together (i.e., Pakistanis and Bangladeshis), seem to be following different patterns; second, it has shown that parental social origins have divergent effects on educational and labour market outcomes for ethnic minorities; third, it has revealed that some ethnic minority groups, Indian and Bangladeshi men in particular, seem to better overcome initial disadvantageous situations, making them more resilient populations, when compared to other groups and to the white British. Having done two masters specialized in urban studies, the link between social and spatial inequalities has also been an important part of my research agenda. I have done research on three key topics: the measurement of socioeconomic and ethnic segregation, the effect of segregation on outcomes (neighbourhood effects), and the patterns that lead to segregation (residential mobility). I have also explored other aspects associated with immigration in Europe, such as attitudes towards immigration and gender role values.

As for current and future work, I believe there are two research areas that need further development in the context of migration and integration studies. First, most empirical and theoretical work on migrant integration focuses on South-North migration, even though that comprises only a third of total international migration flows. Second, studies on migrant integration are often focused on comparing migrants with local populations at destination. They hence fail to capture the counterfactual of what might have happened in the absence of migration or if the migrant had moved elsewhere. Such a counterfactual is crucial to understanding integration in different contexts and the impact of migration. This concern led me to develop my current Marie Skłodowska-Curie (MSCA) project GLAM—Global South Migration and Comparative Integration: A Study of South American Migrants—, and I also expect it to guide my future research. GLAM studies integration patterns (educational mobility; labour market) of South American migrants across southern and northern contexts, with census microdata. Following this research, I the coming years I would like to: explore other outcomes that can help better understand the impact of migration and how migrants across southern and northern destinations do (e.g., educational scores, health, attitudes); explore other cross-national datasets that can help answer this question, such as PISA data (which shows results from educational tests) and labour force survey datasets; incorporate the analysis of South America in migrant integration debates, and establish a dialogue with debates that happen in the Global North; and engage more with South American scholars investigating these topics in the Global South.

**Resumen del Currículum Vitae:**

I am a sociologist from Argentina (University of Buenos Aires, 2006) and I completed my masters' degrees (Università degli studi di Urbino, 2007; University of Amsterdam, 2010) and PhD (European University Institute, 2015) in Europe. As part of my PhD, I did a one-year research stay in London (IOE & LSE), where I developed most of my thesis. At the end of my PhD, I worked as a postdoctoral researcher in two projects: STYLE 'Strategic Transitions for Youth Labour in Europe' (Brighton Business School, University of Brighton, 2014-2017) and MEDAM 'Mercator Dialogue on Migration and Asylum' (Migration Policy Centre, RSCAS, European University Institute, 2017-2019). More recently, I worked at the University of San Andrés as an independent postdoctoral researcher, within the National Council for Scientific and Technical Research, CONICET (2020-2021, Argentina). This work was suspended when I obtained the position of Marie Skłodowska-Curie Researcher (MSCA), in the Department of Social Sciences of UC3M (since September 2021).

As a result of my study and work in various institutions, I have developed networks with different researchers, which gave rise to several publications, many of them co-authored. In total, I have 4 book chapters and 13 articles in peer-reviewed journals, most of them with high-impact, including Sociology (JIF 2015=2.165, Q1 sociology), Work, Employment and Society (JIF 2019=3.171, Q1 sociology), and Population, Space and Place (JIF 2019=2.591, Q1 demography), among others. Most of my contributions explore different aspects of migrant and ethnic inequalities, including processes of integration in education, the labour market and the urban space, especially in the European context. More recently, I am bringing my expertise on integration patterns to the global south. My MSCA project GLAM - Global South Migration and Comparative Integration: A Study of South American Migrants studies and compares integration patterns of South American migrants in southern and northern contexts.

Over the past 20 years, I have obtained several scholarships and funding, being the MSCA the most important one. Previously, I received research funding from CONICET (Argentina, 2007, postgraduate; and 2020, postdoctoral), the University of Buenos Aires (UBACyT, 2005; undergraduate), and the Royal Netherlands Academy of Arts and Sciences (2009; postgraduate), among others. I have also won two grants for my master's and doctoral studies (Huygens Scholarship Programme and NUFFIC).

My research work has been complemented with teaching and tutoring. During several years I was a teaching assistant in courses on methodology, quantitative methods and statistics at undergrad and postgrad levels, and the University of Buenos Aires and the European University Institute. More recently, I prepared a syllabus for the Master in Social Sciences at UC3M, entitled: "Social stratification II: migration & ethnicity, social class and the neighbourhood", which I gave in autumn 2021. I replicated a shorter version of this course at University of San Martín (Argentina), for their PhD in Sociology. I have also mentored three junior scholars in the past year—who helped with the literature review and preliminary data analyses of GLAM—and supervised the thesis of a master student at UC3M.

Other experiences of (international) engagement and collaboration include my participation in dozens of conferences, summer schools and trainings; the edition of two special i

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | VALENTE , RICCARDO |
| **Referencia:** | RYC2023-043331-I |
| **Correo Electrónico:** | valente_riccardo@hotmail.it |
| **Título:** | Dimensions of social and ecological inequalities in cities |

**Resumen de la Memoria:**

My research spans a range of different topics, all of which are anchored in a conceptual and empirical framework enabling the analysis of processes of social stratification in urban settings and their implications for housing affordability, personal health, and public health. Since my PhD eight years ago, I have devoted my efforts to understanding the relationship between the physical and social attributes of the place of residence and people's behavioural choices. My studies offer a fresh look at traditional approaches in social sciences by digging into the structural causes of residential choice (e.g., housing constraints, material deprivation, life events, etc.) and shedding new light on the exclusionary dynamics of housing markets in our cities. I have addressed these issues emphasizing the intersectionality of gender, race, and socio-environmental inequalities.

I completed my post-secondary education in four countries (Italy, France, Belgium, and Spain). I have conducted comparative analyses in the EU, the US, and Latin America, published in top-quality international journals, delivered dozens of presentations at conferences organized by entities of international standing, and totalled a cumulative period of 15 months as a visiting scholar during two research stays aboard. As a result of my extensive international experience, I have entered a dialogue with leading researchers, which represented a terrific opportunity for me to take a qualitative leap in my research trajectory. This allowed me to structure a network of renowned scholars in the fields of sociology, demography, criminology, and social psychology, with whom I regularly collaborate, and who could be mobilized to accelerate the international agenda of the host university. My roles and achievements in EC-funded and regional projects point to strong leadership in obtaining funds for research and managing international consortia of researchers from different cultural and academic backgrounds.

Because of their implications for society at large, my studies have captured the attention of non-academic actors, including local (e.g., Barcelona City Council), and international institutions (e.g., I was also invited twice, in 2016 and 2022, as a keynote speaker by the United Nations Office on Drugs and Crime, UNODC). My research stands for its strong commitment to open, community-centred, data-driven, applied science toward more equitable and inclusive futures for cities.

If I think of myself five years from now, I see a Ramón y Cajal fellowship as an opportunity to be seized to lay down the foundations for establishing a ground-breaking program of research that seeks to take spatially integrated social science further. Given my multidisciplinary background, I am in the best possible condition to address one of the current gaps in the life course research by combining the spatial analysis of urban environments with a focus on the behaviour of individuals. This would require the implementation of a challenging research line from a longitudinal standpoint to assess neighbourhood change and residential trajectories from childhood to adulthood and how they relate to health, safety and well-being. Therefore, receiving funding from this call is expected to maximize my chances of stepping rapidly into a major research role in the European academic community.

**Resumen del Currículum Vitae:**

In January 2016, I obtained a PhD summa cum laude from the University of Barcelona. My research has been published in top peer-reviewed journals (24 articles in total, 17 as the first or sole author). 18 of these 24 papers have been published in journals ranked in Q1 (10) or Q2 (8) of the JCR Web of Science repository. Taking the Scopus database into account, 20 of these 24 papers appear in journals ranked in Q1. I have also published 3 book chapters, which further accentuate the prolificity of my scientific production (more than 3 publications per year since my PhD). My track record concerning these publications proves my ability to handle complex data and carry out sophisticated statistical analyses, including structural equation models and spatial econometrics.

Being awarded a Leonardo Da Vinci Internship Grant in 2012 was a turning point in my international agenda. This grant gave me a first entry point to research as a possible career path and, ever since, I have been involved with leading roles in 8 national and international R+D+I projects. I was the scientific coordinator of the 2-year project MARGIN (2015-2017; GA no. 653004), awarded 1.8M in funding with the top score of 15 out of 15, and chief data analyst of the EC-funded project SMARTDEST (2020-2023; GA no. 870753), both funded under the Horizon 2020 program. I currently hold a post-doc position in the LIFELONGMOVE research project, which was awarded an ERC-Consolidator Grant under the Horizon Europe funding scheme (2023-2027; GA no. 101043981). These 3 projects alone totalled a budget of almost 7 million euros.

Overall, I am constantly seeking new opportunities to internationalize my research activity. This effort comes about quite naturally because of my inherently international profile and my experience in research projects. Between 2017 and 2018, I spent one year as a post-doc visiting researcher at the Federal University of Santa Catarina in Brazil, during which I received intensive training in the use of GIS-based applications, becoming a pro user of QGIS software. In 2022, I was appointed a visiting scholar at Stanford University. Last December 2023, I was awarded a visitor grant for a research stay at the prestigious Swiss Centre of Expertise in Life Course Research LIVES of the University of Geneva (a visit that will start in March 2024).

I have teaching experience with the bachelor's and master's degrees. I supervised five Bachelor's degree final projects (TFGs) at the Department of Criminology of the University of Barcelona in 2023, plus a sixth during my stay in Brazil in 2017. I am currently assigned the role of mentor of a PhD candidate for the Autonomous University of Barcelona. I have official accreditations from ANECA (Profesor Ayudante Doctor, 2020) and AQU (Lector, 2018, and Profesor Agregado, 2021). A native Italian speaker, I speak fluent Spanish, English, and French, with intermediate Portuguese and Catalan.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | VLASKAMP , MARTIJN |
| **Referencia:** | RYC2023-045690-I |
| **Correo Electrónico:** | mvlaskamp@ibei.org |
| **Título:** | Trayectoria Vlaskamp |

**Resumen de la Memoria:**

I am an Assistant Professor at the Institut Barcelona d'Estudis Internacionals (IBEI). After receiving my PhD (summa cum laude) from the Universitat Autònoma de Barcelona, I have held positions as a Marie Sklodowska-Curie Fellow at Yale University and IBEI, as well as a Beatriu de Pinós Fellow and a Juan de la Cierva Incorporación Fellow at IBEI.

My research trajectory has primarily focused on the interconnected fields of natural resource governance, political instability, and EU external policy. I have contributed significantly to these areas through a number of scientific contributions, which align with three overarching themes:

1. European Union's Policies on Natural Resources: I initiated my research journey with a PhD thesis centered on the EU's approach to natural resources financing armed conflicts. This led to an article analyzing EU actions during the Marange crisis of the Kimberley Process for conflict diamonds, and an article that studied the EU's policies with respect to conflict minerals. My work continues to explore the EU's policies, including how it addresses global transparency standards in the natural resource sector and deals with its increasing demand for critical raw materials.

2. Policies to Disrupt the Link Between Natural Resources and Political Instability: Expanding beyond the EU, I investigated the emergence of the "foreign accountability norm," holding extractive companies responsible for questionable conduct abroad. My co-authored work on this norm has gained significant recognition. Additionally, I surveyed US citizens' support for extraterritorial jurisdiction in resource extraction cases, finding broad bipartisan backing for such regulations. Furthermore, I delved into commodity sanctions and their broader effects, contributing to handbook chapters. My research has also explored environmental peacebuilding and its impact, with ongoing work under review for publication.

3. Public Opinion and Political Instability: My research extends to the relationship between public opinion and political instability. I examined the influence of external factors on public support for secessionism in Catalonia and Scotland. My work in this project has been widely cited and utilized in policy debates.

Overall, my research trajectory showcases an interdisciplinary approach that bridges natural resource governance, political instability, and EU external policies, contributing valuable insights to these complex and intertwined fields.

**Resumen del Currículum Vitae:**

I am an Assistant Professor at the Institut Barcelona d'Estudis Internacionals (IBEI). After receiving my PhD (summa cum laude) from the Universitat Autònoma de Barcelona, I have held positions as a Marie Sklodowska-Curie Fellow at Yale University and IBEI, as well as a Beatriu de Pinós Fellow and a Juan de la Cierva Incorporación Fellow at IBEI.

My research focuses on three main themes: (1) European Union policies related to natural resources, (2) policies to disrupt the link between natural resources and political instability, and (3) the intersection of public opinion and political instability. My work has been published in esteemed peer-reviewed journals such as West European Politics, Resource Policy, Cooperation and Conflict, The Extractive Industries and Society, and others. I have also co-edited two books on EU foreign policy (with Springer and Palgrave) and one on political violence (Tecnos).

I have led research projects and currently head the project "OILDOWN: The Implications of Decreasing Fossil Fuels Demand for Political Stability in the Middle East and North Africa," funded by the Spanish Ministry for Science and Innovation. I also coordinate the research cluster "Security, Conflict, and Peace" at IBEI. My work has been funded by the European Commission, the Spanish and Catalan Governments and private sources, such as the Fritz Thyssen Foundation.

In line with my commitment to open science, I ensure the accessibility of my research results and data. Most of my articles are available through green open access, and I strive for gold open access when feasible. I have also shared raw data in publicly available repositories, facilitating access for fellow researchers.

My research is internationally oriented, with experiences at Yale University, the University of Cambridge, and the Egmont Institute in Brussels. I regularly present my work at international conferences and collaborate with researchers from various countries.

To bring my results under the attention of policymakers, I collaborate with think tanks, authoring policy briefs for CIDOB and serving as a Subject Matter Expert at The Hague Center for Strategic Studies. I am committed to disseminating research findings through blog posts or op-eds in newspapers. I also organize public talks and curated a successful conference series on "the geopolitics of change" at CaixaForum Barcelona.

I mentor and supervise early-stage researchers, having independently supervised 28 master's degree theses and co-supervised a PhD thesis with "summa cum laude" honors.

My research has received favorable external evaluations from the Agency for the Quality of the University System of Catalonia (AQU/Agència per a la Qualitat del Sistema Universitari de Catalunya). I have been accredited as a tenure-track lecturer/assistant professor (Lector) and received a sexenio for excellent research during the 2015-2020 period. I hold an I3 certificate from the General Secretariat of Universities of Spain (I3/2021/0922). Additionally, I serve as a project evaluator for the Commission of Social Sciences of the Spanish State Agency for Research.

**Resumen de la Memoria:**

The main line of research I have developed during my academic career focuses on the relationship between globalization and education policies. My work is thus located at the intersection of global governance, comparative education and policy studies, and examines how education policy ideas are produced, disseminated internationally, and recontextualized in different settings. This line of research departs on the premise that the globalization processes have intensified the circulation of policy ideas and generated new forms of interdependence between territories, thus requiring a multi-scalar approach to policy change. Building on such assumptions, I have developed two main research strands:

1. The role of transnational actors in education policy-making. The main objectives of this first research strand have been (i) to examine the mechanisms, practices and strategies through which transnational actors construct and promote different types of education policy ideas; (ii) to identify the external and internal factors intervening in processes of ideational change within international organizations; and (iii) to understand how transnational actors interact in the production and diffusion of global education policies. In pursuit of these objectives, I have conducted a range of studies concerned with the ideational work of different transnational agencies, drawing on a large corpus of interviews, observational data and documentary analysis which have granted me a fine-grained understanding of the micro-sociological foundations of such processes.

2. The adoption and recontextualization of global education policies. This second research strand is concerned with the following objectives: (i) mapping the domestic policy trajectories of globalizing education ideas, capturing differences in their rationales and policy designs; (ii) systematizing the mechanisms of variation behind such diverging policy trajectories; and (iii) examining how such recontextualization processes shape the differential outcomes of these policies in different world location. To this end, I have conducted a range of cross-national studies addressing the spread and recontextualization of different global policy ideas. Specifically, I have developed a typology of paths toward education privatization that captures different combinations of drivers of policy change, and I have analyzed the spread of a variety of policy instruments including school accountability arrangements, large-scale learning assessments and school autonomy reforms.

**Resumen del Currículum Vitae:**

I initiated my academic career in 2015 at the Department of Sociology of the Autonomous University of Barcelona, where I conducted my doctoral studies with the support of an FPU Fellowship. After completing my PhD, I joined the University of Glasgow as a Postdoctoral Researcher. In 2023 I was awarded a British Academy Postdoctoral Fellowship, one of the most prestigious research fellowships in the United Kingdom. I am currently the principal investigator of a three-year investigation addressing the expansion, institutionalization and evolution of large-scale learning assessments from a cross-national perspective.Prior to that, I have participated in three competitive research projects concerned with the global trajectories of education policies. During my doctoral and early postdoctoral period, I have also led and co-led research contracts and consultancies for international organizations such as UNESCO, Open Society Foundations or Education International.

I have published 44 pieces of research, including 16 articles in indexed journals (JCR), 15 book chapters in edited volumes published by prominent, international academic presses, and a monography. I have published in a range of high-impact journals, including several leading journals in the fields of comparative education and education policy studies (e.g. Comparative Education, Journal of Education Policy, International Journal of Educational Development). I have also published a co-authored monograph on the political economy of education privatization edited by Teachers College Press. In terms of the academic relevance of my research, according to Google Scholar metrics my publications have received 1905 citations since 2017, and my h-index is of 18, with an annual average of 373 citations in my postdoctoral period (2021-2023).

I am actively involved in the comparative education and education policy international research communities. I am a member of the Editorial Board of the journal Comparative Education and a member of the College of Reviewers of the journal Compare, and I regularly present and organize panels at international research conferences such as the European Conference on Educational Research and the Annual Meeting of the Comparative and International Education Society. I have been invited as an expert in different international workshops and encounters with educational stakeholders and policy-makers, and I have organized and developed dissemination and outreach activities of the different research projects I have participated in – including seminars and workshops with academics, policymakers and civil society organizations.

Finally, I have demonstrated the capacity to attract research funding and the ability to lead different research projects and contracts. During my doctoral studies and early postdoctoral period I secured various research contracts, received additional research grants from diverse funders, and contributed to the preparation of two successful research bids. During my postdoctoral period I have also demonstrated a significant research funding attraction record, being the principal investigator of a competitive research project funded by the British Academy (380,000 EUR) and securing complementary funding through the Lord Kelvin/Adam Smith Fellowship (110,000 EUR).

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Ciencias sociales
**Nombre:** GIL , JAVIER
**Referencia:** RYC2023-045822-I
**Correo Electrónico:** jagil@poli.uned.es
**Título:** The new political economy of housing: global corporate landlords, generation rent and public policy

**Resumen de la Memoria:**

My research lies at the intersection of the fields of Housing Studies, Urban Sociology and Digital Platforms. I started my PhD as FPI pre-doctoral researcher in Sociology, at the National University of Distance Education (UNED). During my PhD program I investigated the Airbnb platform in relation to the economic processes it was generating, its effects on housing and urbanism, and the social protests and conflicts that engendered. Years later, Airbnb became a central political and social feature in all global cities.

Over time, my research focus has shifted towards housing financialization, the rise of private equity funds as major global corporate landlords, and the subsequent disputes arising in urban areas across the globe. Presently, these phenomena have escalated into prominent social, economic, and political challenges, with particularly pronounced effects in Spain, where their impact is of considerable significance. Between 2020 and 2022 I was postdoctoral researcher at the Institute for Housing and Urban Research (Uppsala University). Currently I am a Maria Zambrano fellow, working as the Principal Investigator of the project "GENERATION RENT: Socio-economic and political impacts of the changes in the housing system in Spain after the 2008 crisis", funded by the European Union-NextGenerationEU and the Ministry of Universities. Between 2020 and 2023 I conducted researched in a project financed by the Swedish Research Council for Sustainability (FORMAS) with a budget of 286.347€, with Professor Miguel A. Martínez as PI.

My research agenda focuses on the evolving dynamics within housing systems and markets. This includes examining the transformative role of investment funds as they increasingly assume the position of global corporate landlords, and the entrenchment of 'generation rent' in the aftermath of the 2008 financial crisis. The latter has become particularly relevant as rental housing has emerged as the predominant mode of housing access for younger demographics.

My research career has been awarded multiple times. The last award was granted by UNED and Banco Santander in 2021 as the "Thesis with the greatest impact on research, scientific transfer and dissemination of scientific knowledge" (in the modality of "dissemination of scientific knowledge").

My aim is also to implement policy-oriented research and I have obtained significant impact with policy makers. During the last years I have advised or produced policy reports for: the European Parliament (2021), the Human Rights Directives on the Financialization of Housing led by the former United Nations Special Rapporteur on Adequate Housing, Leilani Farha (2022-2023), Canada's National Housing Council, (2023) or the Barcelona City Council (2017) within others.

In recent years, my work has achieved a significant impact on knowledge dissemination through mainstream and social media platforms. Multiple media outlets have disseminated the findings of my research over the last years. These include: La Sexta, TeleMadrid, La Cuatro, Cadena Ser, RNE, El País, El Confidencial, elPeriódico de España, ElDiario.es, Público, El Español, Ctxt or el Salto. I have diligently undertaken extensive outreach efforts on the social media platform X, and some of my academic works on this platform have reached over a million people.

**Resumen del Currículum Vitae:**

I completed my PhD in the Universidad Nacional de Educación a Distancia (UNED) in May 2019. My dissertation explored the social and urban impacts of Airbnb and short-term rentals. Throughout my doctoral studies, I was granted with three research fellowships, which allowed me to become a visiting researcher at the University of California, Berkeley (2017), New York University (2016), and the State University of New York (2015-2016), consolidating myself as an international researcher in universities of recognized prestige.

I received two awards as PhD student from the Madrid Association of Sociology (Young Sociologists Awards, 2015 and 2017). Furthermore, I received the Extraordinary Doctorate Award from the Vice-Rectorate for Research, Knowledge Transfer and Scientific Dissemination (UNED) in 2020. In 2021, I was awarded in the modality of "dissemination of scientific knowledge" at the UNED and Banco Santander Awards for the "Thesis with the greatest impact on research, scientific transfer and dissemination of scientific knowledge".

In 2020, I started working as a postdoctoral researcher at the Institute for Housing and Urban Research (Uppsala University) with a contract until 2024. Since January 2023 I am a Maria Zambrano fellow at UNED, working as the Principal Investigator of the project "GENERATION RENT: Socio-economic and political impacts of the changes in the housing system in Spain after the 2008 crisis", funded by the European Union-NextGenerationEU and the Ministry of Universities.

I have published a total of 22 articles in indexed journals, with 17 indexed in JCR and 16 in SJR. Among these, in the JCR four are ranked Q1 and seven are Q2, while in the SJR ten are Q1. Journals such as Housing, Theory and Society; International Journal of Housing Policy; Housing Studies; Urban Studies; Journal of Urban Affairs and Cities. I have also contributed to 18 book chapters, 14 of which are with SPI publishers. Some are from highly prestigious editorial houses in Sociology, including Centro de Investigaciones Sociológicas as well as internationally renowned publishers like Edward Elgar Publishing or Oxford University Press (forthcoming). According to the Google Scholar index, my work has been cited 594 times, with an h-index of 13 and an i10-index of 15.

In terms of teaching and supervision, I have accumulated 564 teaching hours accredited by ANECA across six universities: Uppsala University, Duke University, Swiss Federal Insti-tute of Technology, UPM, UOC, and UNED. I am also accredited by ANECA as "Profesor Contratado Doctor.

Currently I am also researcher in the projects "ONDEMANDCITY: Platform capitalism, digital workers and the techification of everyday life in the contemporary city", financed by the Ministry of Science and Innovation (Reference: PID2021-122482OB-I00). PI: Dr Jorge Sequera. Budget: 60500€; and "Compromisos sociopolíticos y activismos juveniles en una sociedad individualizada. Formas, significados y procesos de transformación (Youth Activisms)". Proyectos de I+D+i Retos Investigación (PID2020-117529RB-I00). PI: Pro. Jorge Benedicto.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | BENYEI PECO, PETRA JOHANNA |
| **Referencia:** | RYC2023-042720-I |
| **Correo Electrónico:** | petra.benyei@gmail.com |
| **Título:** | Transdisciplinary approaches to the study of agrarian socio-ecological systems |

**Resumen de la Memoria:**

My research is fundamentally transdisciplinary. I mobilize diverse social science disciplines and methods and co-produce knowledge with non-academic knowledge holders to study agrarian socio-ecological systems and the dynamics of agrarian knowledge production and use. I currently have four main research lines: *1. Environmental Anthropology and Ethnoecology.* I investigate the documentation, transmission, conservation and protection of Indigenous and Local Knowledge (ILK) and Traditional Ecological Knowledge (TEK). My main contributions to this topic area are two highly-cited journal articles on ILK for conservation in Ambio and Nature Sustainability (Q1). I also have developed CONECT-e, a successful Citizen Science platform for documenting Traditional Ecological Knowledge in Spain. *2. Sociology of Knowledge.* I investigate the institutions governing traditional and indigenous agricultural knowledge systems, and the impact of such governance on food sovereignty and environmental justice. My main contributions to this topic area is a seminal book chapter exploring Traditional Agricultural Knowledge (TAK) as a commons. I have also investigated the role of ILK in social movement struggles against threats to community-based natural resource management systems, providing a novel analytical framework that was published in the Q1 journal International Journal of the Commons. *3. Science and Technology Studies.* I investigate challenges, strategies and impacts of technology adoption and of implementing Citizen Science (CS) in rural and marginalized agrarian communities. My main contributions to this topic area are three widely-cited articles on participation trends, impacts and challenges of citizen science in the Q1 journals Science, Technology and Human Values; Ecology and Society; and Citizen Science: theory and practice. *4. Rural Sociology and Political Agroecology.* I investigate socio-political and economic factors contributing to the vulnerability/resilience of local socio-ecological agrarian systems. This is my most recently opened line of research. Many contributions to this topic area are still under development, but I have already published a conference proceeding for the IX International Agroecology Conference, adapted and now under review in the journal Agriculture and Human Values. I am also a member of the AgriAmbio Knowledge Transfer Platform, aiming to improve the environmental, social, and economic impacts of the Common Agricultural Policy (CAP) in Spain. As part of my work in this platform, I lead research looking into Objectives 7 and 8 of the Spanish CAP Strategic Plan (generational renewal and gender equality). In the years to come I will contribute to this science-policy interface platform with results from my latest granted project (FARM, "la Caixa" Social Research Call 2023), focusing on the gendered factors shaping farmer generational renewal in underpopulated rural areas in Spain.

**Resumen del Currículum Vitae:**

My scientific career began with a Rural Development Master across Ghent University, Pretoria University, and Agrocampus Ouest, funded by an Erasmus Mundus Scholarship (2013-2015). I engaged in two impactful research projects, one examining Inclusive Business Models in South African agriculture, resulting in a published book chapter, and another focusing on the adoption of climate change mitigation technologies in Spanish olive groves, with two journal articles published. With a Magna Cum Laude for my Master thesis, I secured a MINECO FPI grant (BES2015-072155), linked to the Spanish project "Ciencia ciudadana y conocimiento agroecológico tradicional" (CSO2014-59704-P). This funded a pre-doctoral post at ICTA-UAB and a research stay at UCBerkeley, USA (2016-2019). My doctoral thesis received a Summa Cum Laude and won the 2020 Extraordinary Environmental Science PhD prize. It explored the impact of a citizen science initiative (conecte.es) aimed at documenting and protecting traditional agroecological knowledge, and generated eight journal articles, four book chapters, and six dissemination articles. During my PhD studies, I became a member of the European Citizen Science Association and later co-chaired the "Empowerment, Inclusiveness and Equity" and "Agri-Food." working groups. This involved organizing meetings, presenting at conferences, and leading an indexed journal article related to the challenges and impact of implementing citizen science in marginalized and rural communities. Simultaneously, my first postdoctoral post was in the European project "LICCI" (Local Indicators of Climate Change Impacts, 771056-LICCI-ERC-2017-COG, 2020-2021). I led the development of the project's citizen science platform (opentek.eu) and contributed to an international collaboration of researchers studying climate change impacts perceived by Indigenous peoples and local communities. This work has generated six indexed journal articles, one book and one dissemination article. In 2022, I worked as a rural development consultant for NANOMA, a company specialized in rural development project design and implementation. Subsequently, I secured a Juan de la Cierva Formación grant (FJC2021-047229-I) to fund my current postdoctoral fellowship at CSIC (2023-2024). Without disrupting my work with ECSA and LICCI, I have initiated new research avenues: 1) Joined the PTI AgriAmbio, an interdisciplinary platform that works together with the Spanish Ministry of Agriculture to evaluate the Common Agricultural Policy, and 2) Won a "la Caixa" Social Research Call grant (LCF/PR/SR23/57000002). In these new projects, I investigate the gendered factors influencing farmer generational renewal and the adoption of sustainable farming models in underpopulated rural Spain. In sum, in my scientific career to date, I have published 21 articles in indexed journals (9 as lead or corresponding author), including 19 in Q1 journals. I have also published 8 book chapters and 13 international conference proceedings. All my publications (29) are Open Access and I have a Scopus h-index of 10, Google Scholar h-index of 13.

**Área Temática:** Ciencias sociales
**Nombre:** LÓPEZ RODRÍGUEZ, MARÍA DOLORES
**Referencia:** RYC2023-045489-I
**Correo Electrónico:** mlr538@ual.es
**Título:** Cooperative action behaviours for sustainability transformations

**Resumen de la Memoria:**

My main research topic is focused on examining elements and methodological pathways that may (or may not) act as driving forces for activating cooperative action behaviours for sustainability transformations, especially between scientists and non-scientists. I focused my research on the area of sustainability since it is well-recognized that embedding social considerations in such an area is essential to foster social change for sustainable development and needs to be more thoroughly explored.  I have conducted social science research around a wide diversity of environmental topics (e.g. biodiversity conservation, water management, bioeconomy) in diverse countries (e.g., Peru, Morocco, and Spain). During my academic life, I have gained vast experience in qualitative and quantitative social research science methods, which raised my interest in examining and designing multiple methodological pathways to facilitate cooperative behaviors for sustainability. My independence and capacity to generate this type of research allowed me to become a recognized and independent scholar in the research field. I have gained valuable experience that allowed me to establish a wide network of research collaborations and to be part of relevant global scientific networks. As my CV shows, I have a strong record of proven ability to work across disciplines and in multicultural environments, to publish a large number of articles in peer-reviewed journals and to present my research in international scientific conferences. I have experience in leading research projects, which proves my independence as a researcher working at the interlinkages between social and natural sciences. I have granted with an HIPATIA postdoctoral contract to develop a research program that contribute to consolidate my research topic at UAL. In the coming years, I aspire to continue working on this research topic and contributed to its further development. To do that, I plan to develop a new research line for the following years to understand how collective action across science, policy, and society can be supported, guided and operationalised from a science-based methodological perspective. To meet the general goal, I aspire to answer the following research questions: 1) to what extent can collective action be supported and guided from a science-based methodological perspective?, 2) what values, beliefs and attitudes underpin academics and non-academics to engage in collective action for sustainability, and 3) which participatory conditions, factors, and tools are critical to engaging people in collective action networks for sustainability according to value-based behaviours?. The RyC fellowship would significantly contribute to my career trajectory by enabling me to exponentially build on my research and skill set to date, paving the way for promotion into a tenured position and equipping me with the necessary resources and protected time to kick-start my own ambitious research program – an essential step towards building my research group and establishing myself as an independent research leader.

**Resumen del Currículum Vitae:**

I got my PhD in Applied Environmental Sciences at the University of Almería (UAL) in 2016. I have accumulated a total of 7 years of postdoctoral experience through different positions at UAL and Universitat Oberta of Catalunya (Spain), which has been complemented and enriched with international research stays at prestigious universities in Germany, Sweden, Switzerland, and Perú. My research career accumulates 48.7 months out of UAL, where I developed my doctoral thesis.

My research experience includes a total of 45 research publications, including 3 books, 4 book chapters, 16 outreach publications, and 22 articles in indexed journals [21 articles published in JCR-journals (10 in Q1, 8 in Q2, 3 in Q4) and 22 articles published in SJR-journals (16 in Q1, 4 in Q2, 2 in Q4)]. I have led 8 articles as the first author, and I have been the corresponding author (CA) in 41% of all the articles. I have developed most of my publications without the participation of my PhD supervisors (68% of my articles, 100% of books, and 50% of chapter books). Sixty-seven percent of my articles have been with researchers out of UAL. My work accumulates a total of 594 and 10 h-index (Google Scholar), 397 citations and 9 h-index (Scopus), 334 and 8 h-index (WoS). I have an article awarded as the best paper published in the journal "Ecosystems and People" in 2019. I have been guest editor of 2 special issues (leading 1 of them) in prestigious and indexed journals and co-chair in 5 scientific sessions (leading 2 of them) at international and national conferences. I have participated in 32 Oral communications and 4 Posters (75% of them as the first speaker/author). I have participated in the scientific and local coordination of the Spanish Ecology Society Conference 2023.

I have successfully acquired funding as a Principal Investigator (PI) from two competitive grants (~€182,100.00) and as a collaborator of two research projects funded (~€ 129,000.00). I have successfully secured external funding from competitive international and national organizations to develop international research stays (~€28,100.00). I have participated in 4 international research projects (one of them as Co-IP), 2 research projects at the national level, and 4 national contracts with public administrations to generate scientific outcomes translatable to the policy domain.

I have led and conducted a total of 30 workshops in diverse countries to translatable scientific outcomes to policy and society and multiple dissemination activities. Most of my research has produced relevant scientific contributions while achieving instrumental impacts on policy and society. An illustrative example is the innovative study I led that supported the creation of a national legislative reform in Perú.

I have teaching experience, both nationally and internationally. I teach at UAL in 2 graduate course in Masters. I have supervised 8 MSc students, 6 at UAL and 2 at the University of Stockholm. I have co-led an international postgraduate course at UAL to teach graduate students from different countries. I have been invited to give lectures by different European and Latin-American universities. I have also been part of the research committees for PhD and MSc students.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | CASTRO TORRES, ANDRES FELIPE |
| **Referencia:** | RYC2023-042730-I |
| **Correo Electrónico:** | acastro@ced.uab.es |
| **Título:** | From Numbers to Narratives: Unraveling Social and Epistemic Inequalities |

**Resumen de la Memoria:**

I am a sociologist interested in socioeconomic inequalities, international migration, family change, and global dynamics of knowledge production. My research focuses on global South countries and populations and North/South disparities in knowledge production. I have published 21 peer-reviewed articles in sociology, quantitative methodology, demography, public health, and multidisciplinary journals (nine as a leading author and five as a co-author). None of these 21 articles have been co-authored with my Ph.D. adviser. I have worked at leading research centers: the Population Studies Center of the University of Pennsylvania in the United States (UPenn), the National Institute for Demographic Studies in France, the Max Planck Institute for Demographic Research in Germany, and the Center for Demographic Studies in Spain. I have been awarded three predoctoral (~140k€) and three postdoctoral independent research fellowships (~296k€). I have given more than 20 oral presentations at conferences by leading associations of my field: the Population Association of America, the American Sociological Association, the International Union for the Scientific Study of the Population, the British Sociological Association, the European Sociological Association, and the Latin American Association for Population Studies. I have been invited as a speaker by Heidelberg University (Migration systems in the Americas), Essex University (Gender and family dynamics among immigrants), the Nordic Network for the Science of Science (Diversity in Scientific Research), and the Brazilian Association for Population Studies (The use of administrative records in research). I have worked as an independent consultant for the Colombian Ministry of Planning, the United Nations Relief and Works Agency for Palestine Refugees in the Near East, and the United Nations Population Fund

The overarching aim of the proposed research line is to uncover understudied populations and marginalized theoretical and methodological approaches in quantitative social research to help correct social and epistemic injustices. The project will do so by: (i) assessing the scope of existing theories and methods in the inequalities and family literature using a science-of-science perspective, (ii) empirically studying geographical contexts and minorities within societies that are often overlooked in research due to their small size or because they are defined by the intersection of social categories of disadvantage, and (iii) examining the connection between both: Does the way knowledge is produced impact the visibility of minorities in research? And how does that limit our capacity to understand socioeconomic inequalities and family change? The project will rely on an interdisciplinary team, an international network of scholars, large and complex datasets, and a novel inductive approach to quantitative analysis to leverage dialogues between epistemological and substantive investigations. This combination of studies will contribute to a novel understanding of socioeconomic inequalities and family patterns in contemporary societies and will provide hints on how to promote greater equality in epistemic terms making quantitative social sciences more inclusive and global.

**Resumen del Currículum Vitae:**

I am a Colombian sociologist with a Ph.D. in Demography and Sociology from the University of Pennsylvania (2019). My research focuses on social class and gender differences in family formation and dissolution trajectories, primarily in countries of the global South and among immigrants in the United States and Europe. I use censuses, surveys, administrative records, and vital statistics to answer questions about how the people's material living conditions throughout their life course associate with specific family and migration paths, and how these family and migration paths influence social class and gender disparities. I also research global inequalities in knowledge production in social sciences.

Academic positions
2023 – Beatriu de Pinos Postdoctoral Research Fellow, Center for Demographic Studies.
2022 – Research Guest, Max Planck Institute for Demographic Research, Fertility and Well-being laboratory.
2022-2022 – Juan de la Cierva research fellow, Center for Demographic Studies.
2019-2021 – Postdoctoral researcher, Max Planck Institute for Demographic Research, Fertility and Well-being laboratory.

Education
Ph.D. in Demography and Sociology, University of Pennsylvania, Philadelphia, United States, 2019
Dissertation: "Half a Century of Migration and Family Formation in Latin America and the Caribbean." Advisor: Prof. Herbert Smith.
- One-year visiting student at the Institut national d'études démographiques, Paris, France
Master of Arts – Demography, University of Pennsylvania, Philadelphia, United States. 2016
Master of Science – Statistics, Universidad Nacional de Colombia, Bogotá, Colombia. 2012
Bachelor of Arts – Sociology, Universidad Nacional de Colombia Bogotá, Colombia. 2012.
Bachelor of Engineering – Industrial Engineering, Universidad Nacional de Colombia, Bogotá, Colombia. 2010

Research coordination experience: I am a founding member of the Global Family Change project (https://web.sas.upenn.edu/gfc/) hosted by the University of Pennsylvania and involving researchers from the Center for Demographic Studies (Spain), New York University (US), Oxford University (UK), and Bocconi University (Italy). I am also the PI of a two-year research project involving PhD students, postdoctoral researchers, communication professional, and two Spanish governmental institutions. I am a coordinator of the Family Research Network (Red-LAFAM, approx. 70 members) of the Latin American Association for Population Studies (https://www.alapop.org/).

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | ZUERAS CASTILLO, PILAR |
| **Referencia:** | RYC2023-042942-I |
| **Correo Electrónico:** | pzueras@gmail.com |
| **Título:** | Ageing well, healthy, independently and in place |

**Resumen de la Memoria:**

I am a social demographer specialising in ageing, families and health inequalities and have established myself as a leading researcher on population ageing and elder care in Spain. Currently I co-lead the research team on elder care at the Centre for Demographic Studies (CED, Spain). Over the years I have led 1 technology development and 2 competitive R&D projects and have participated in 16 more on these topics. I have engaged with stakeholders and policy makers and led collaborative research with the third sector, namely Association of Friends of the Elderly (AGG). I was an invited member of the expert panel on care promoted by the Barcelona Provincial Council to contribute to the development of a new public care system in the community (2021-23) and was invited to participate in the Congress on Care: Towards a Basque Care Pact organised by the Basque government (Nov 2023).

I have studied the relationship between population dynamics and both individual well-being and the societal challenges of demographic ageing, contributing to population health, healthy ageing, elder care, independent living, and retirement. My current research focuses on healthy life expectancy and well-being in old age, and I have recently joined the research team of the HEALIN project, ERC Consolidator Grant led by Dr Permanyer (ICREA researcher). I have collaborated with other renowned demographers in other areas of my expertise. My last publication on carers' health was co-authored with Prof Grundy, and we are now investigating the potential buffering effect of social and community support on carers' health. In the area of independent living, I have worked in the past with Dr Esteve and Prof Reher.

Throughout my academic career I have had an independent role in research. I also have experience in doctoral supervision, mentoring and an active role in talent attraction and retention. My work has been funded by 8 competitive grants, including 3 as principal investigator. In 2021 I received funding from the Barcelona Science Plan to investigate the impact of ageing, urban change, and neighbourhood context on social isolation. I was the principal investigator of the project GRANBCN, which had a multidisciplinary approach with three partners from demography (CED), urban geography (UAB) and the AGG. I think it is essential to understand the role of social connections and neighbourhood context in the interaction between individual characteristics and well-being at this stage of life. As a result of the death of family and friends and reduced mobility due to retirement or declining health, older adults become more vulnerable to their neighbourhood context, social support, and community resources.

The overall aim of my research is to investigate and provide evidence that contributes to informed decision-making and practice to improve the conditions that enable people to age healthily, well, independently and in place. While my past research has focused on individual and institutional factors affecting the health and wellbeing in later life, in the coming years I aim to broaden the understanding of the topic by considering older people's social connectedness and the role of the community. I am also interested in looking beyond physical health to other aspects of older people's wellbeing, such as the risk of social isolation, loneliness, mental health, and cognition.

**Resumen del Currículum Vitae:**

I completed my PhD in Demography as an FPU doctoral fellow at the Department of Geography at the Universitat Autònoma de Barcelona (UAB, 2014). Since then, I have been working as a researcher at the Centre for Demographic Studies (CED) where I co-lead the research team on Elder Care. In 2020-22 I worked at the Institute for Social and Economic Research at the University of Essex (UK) s a researcher of the Centre for Micro-Social Change funded by the Economic and Social Research Council (ESRC ES/S012486/1). In January 2024 I joined the research team of the HEALIN project - funded by an ERC Consolidator Grant and led by Dr Permanyer - at the CED to study health inequalities.

My research outputs include 20 indexed papers -9 as lead author- in top field international journals such as Social Science and Medicine, Population and Development Review, International Journal of Public Health, Ageing & Society. My outputs also include 17 more peer-reviewed publications, including 4 scientific bulletins addressed to stakeholders and 2 book chapters, and contributions to 40 conferences, mostly international.

My work has been supported by 8 grants awarded through competitive schemes, including 3 as a Principal Investigator (one of them as Lead Researcher too). I was the lead researcher of GRANBCN, which had a multidisciplinary approach with three partners coming from demography (CED), urban geography (UAB), and the third sector, namely the Association Friends of the Elderly (AGG).

Since 2017, I have been co-principal investigator and coordinator of the knowledge transfer project 'Social Explorer Spain', initially funded by the 'la Caixa' Foundation and now by CERCAGINYS. I have supervised and coordinated an international research team of more than ten people. In line with the principles of open science, this project aims at knowledge transfer and social impact, facilitating access to data by collecting, documenting, harmonising and disseminating thousands of social and demographic variables at different geographical levels for Spain. In 2021, we launched www.exploradorsocial.es, an open access platform for the social sciences, which is one of the CED science and technology facilities.

I have received several competitive research and travel grants from Spanish research agencies: FPU doctoral fellowship (2009-13), Juan de la Cierva postdoctoral fellowship (2017-18), and mobility grants to visit the Institute National d'Études Démographiques (Paris, 2010) and the Population Research Centre (Groningen, 2018). I also obtained funding for the acquisition of technical and scientific knowledge abroad. Sponsored by the CED, I attended the European Doctoral School in Demography (EDSD, 2011/2) organised by the European Association for Population Studies. I also benefited from COST Action training and visiting grants in Lausanne (IS1409, 2016) and Manchester (CA15122, 2019).

I have experience in supervising, mentoring and talent attraction and retention. I have supervised five MSc EDSD students and PhD candidates, including 1 completed PhD (2018, UAB) and 1 to be defended in 2024. I have evaluated research proposals for national research agencies and reviewed for top peer-reviewed journals in my area of expertise.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | BUIER , NATALIA |
| **Referencia:** | RYC2023-045872-I |
| **Correo Electrónico:** | nelibuier@gmail.com |
| **Título:** | Unraveling the socio-ecological bases of contemporary accumulation processes: from the infrastructure boom to groundwater struggles |

**Resumen de la Memoria:**

Firmly rooted in the discipline of anthropology, but energized by perspectives from critical geography, political ecology and political economy, my long-term research agenda has prioritized the analysis of the lived experience of socio-ecological transformations and environment-making processes. Concretely, this has taken the form of two research lines: one on infrastructural developmentalism and a more recent one on the water-agriculture-conservation nexus. My research line on infrastructural developmentalism built on my doctoral dissertation and was consolidated at the MPI for Social Anthropology,  where I lead the research line on infrastructure and carried out my own project on the development of Spanish high-speed rail. This involved carrying out a research project with three sub-components (HSR and market-led institutional transformation, HSR and labour relations, HSR and financialized urban development), recruiting and training a research assistant and supervising their work (Diego Ruedas Torres), being the main organizer of an international workshop and participating in the organization of other international events. This research line has produced a strong record of outstanding contributions in the form of articles in Q1 international journals, book chapters with prestigious publishers, numerous invited presentations and conference papers, as well as an exceptional network of international collaborators. In addition to the already mentioned edited volume in preparation, a major outcome of this research line will be my monograph Frontiers of Appropriation: Spanish High-Speed Rail and Capitalist Environment Making (accepted for review at Berghahn). In the fall of 2021 I joined the Department of Social Anthropology at the University of Barcelona and initiated a new research line, theoretically and analytically addressing the relationship between exploitation and extraction and empirically focused on groundwater conflicts in the region of Doñana. As a PI of " Origins of Scarcity: Labour and the Metabolism of Groundwater Scarcity in the Doñana Socio-Ecological System" I have gained additional experience in project management and consolidated my management skills. Among others, this has been achieved by coordinating the development of the multimedia cartography " Echoes of Doñana", which has involved recruiting and  coordinating the work of training, programming and design. I have further consolidated this research line as a member of the FOOD-PAN project (PI: Susana Elena Narotzky, PID2020- 114317GB-I00), as a member of which I lead the research line on water. My ability to draw cross-cutting themes from my research is illustrated by interventions such as my 2023 article in Focaal (following the publication of which I was invited to join the editorial board) and my involvement with the Global Research Programme on Inequality, where as a co-leader of the research line " The Coming Contestation: Green Transition Finance and Inequality in the Global South", I draw both on my ample experience studying green infrastructure and my more recent work on ecological distribution conflicts (in collaboration with Wesley Maraire).

**Resumen del Currículum Vitae:**

I am a researcher with a background in social anthropology and sociology and an eminently international research trajectory. I am currently a research associate at the University of Barcelona and an affiliate of the Global Research Programme on Inequality  (International Science Council/University of Bergen), where I am conducting my own research line on the interlinkages of exploitation and extraction in contexts of environmental crisis. I have initiated this research line with my Marie Slodowska-Curie project addressing the social metabolism of groundwater in the region of Doñana, hosted by the Department of Social Anthropology at the University of Barcelona. My other long research arch focuses on capitalist environment-making and infrastructural development. I began conducting research on the Spanish railways at the doctoral stage. After successfully defending my doctoral dissertation (summa cum laude, dissertation committee Don Kalb, Violetta Zentai, Susana Narotzky) at the Central European University (2016), I started leading my own research line on the development of Spanish high-speed rail (HSR) at the Max Planck Institute for Social Anthropology. In a landscape dominated by economic and technical approaches to HSR, my research on infrastructure represents a unique historical ethnographic take the originality of which is reflected in my work being published by internationally leading journals such as Antipode and Capitalism Nature Socialism as well as prestigious publishers such as MIT Press and Routledge. My future monograph, Frontiers of Appropriation: Spanish High-Speed Rail and Capitalist Environment-Making (accepted for review at Berghahn), will be, to the best of my knowledge, the first book-length historical ethnographic study of the Spanish HSR project.I am also a theme section editor  and editorial board member of Focaal: Journal of Global and Historical Anthropology, a distinguished international peer-reviewed journal (Q1). I have taught undergraduate and MA students (University of Barcelona, Martin-Luther University, Central European University) and have supervised dissertation work at the MA level. My publication trajectory reflects both my independence (single-authored articles and book chapters in top journals and with prestigious publishers) and my ability to initiate and maintain collaborations with senior researchers (Jaume Franquesa; Susana Narotzky). My research has been funded by prestigious funders including the European Council and the Wenner-Gren Foundation. I have managed to secure funding to conduct independent research already at the doctoral stage, and most recently I have been leading the Marie Sklodowska-Curie project " Origins of Scarcity: Labour and the Metabolism of Groundwater Scarcity in the Doñana Socio-Ecological System". I am currently co-leading the research line " The Coming Contestation: Green Transition Finance and Inequality in the Global South" at the Global Research Programme on Inequality. I have presented my work at over 30 international conferences in 12 countries and have been an invited speaker, among others, at CITRA/CONICET (Buenos Aires, AR), University of Bergen (Bergen, Norway), Babeș-Bolyai University (Cluj-Napoca, Romania), University of Leiden (Leiden, Netherlands), University of Marburg (Marburg, Germany).

**Área Temática:** Ciencias sociales
**Nombre:** CONDE PUIGMAL, MARTA
**Referencia:** RYC2023-045160-I
**Correo Electrónico:** marta.conde@uab.cat
**Título:** Social responses to extractive industries

**Resumen de la Memoria:**

I hold the competitive I3 certification, the prestigious Marie Sklodowska Curie fellowship since 2021, and served as Co-PI of the Recercaixa project Activism Mobilising Science since 2018. I have led research teams, coordinated, and conducted research in 9 national and international projects. I have strived to generate societal and policy impact by co-creating pertinent knowledge with local groups and social movements through Open Access research that include 15 Q1 peer-reviewed publications, 4 reports and 4 book chapters. I have disseminated this through the organization of non-academic workshops and events (7), numerous talks (12), a documentary, as well as academic seminars (11) and conferences (11). In terms of mentoring, I have supervised 2 PhD and 5 master students, and co-founded in 2017 the Master program on Political Ecology, where I serve as the coordinator and teach the Political Ecology module.

I study of social responses to socio-environmental impacts and inequalities caused by extractive industries. Through my PhD I pioneered the study of uranium mining impacts and social responses in Africa. Together with CRIIRAD (a French nuclear watchdog) we co-created several reports and publications useful for local groups. Advancing research on social responses to extractive industries, two of my most shared publications explore the strategies of resistance and uncover why some communities react while others do not. Moreover, I explore in particular two strategies of resistance; i) the alliance between activist and scientists highlighting the importance of local knowledge in co-production processes. I have been invited to present this work at different seminars and workshops as well as a publication in a Special Issue contributing to Science and Technology Studies. ii) Environmental litigation is an increasingly used strategy with unexpected consequences that can cause demobilization, invisibilization of harms and victims and monopolization of other strategies, narratives and demands. Through a postgraduate fellowship at Durham University I explored the governance and legal implications of Deep Sea Mining, with legislation advancing at national and international level without responding elementary questions like what is the seabed and what will be impacted, or who are the stakeholders that should be consulted. I networked and presented these ideas through the OCEANGOV Cost Action and with NGOs like the Deepsea Conservation Coalition. Through my work in the NATURVATION Horizon 2020 project and my own Marie Sklodowska Curie fellowship I am now exploring socio-environmental conflicts in the energy transition by linking the energy and material demand of urban areas (what is known as planetary urbanisation) with the increase in demand of certain key minerals that is already generating impacts and conflicts worldwide. As I point through my work on commodity frontiers and the analysis of nickel, a key transition mineral, there is a need to reduce energy and material consumption advocated by degrowth ideas, not only to avoid the impacts of extractivism but also climate change. I have shared this research extensively with advocacy and activists groups, through my teaching, as well as academic and non-academic seminars and conferences.

**Resumen del Currículum Vitae:**

I am a social sciences researcher specializing in political ecology and the sociology of environmental movements. My scientific contributions provide a comprehensive analysis of the perceptions, motivations, narratives, and strategies exhibited by local groups and social movements when confronted with extractive projects. Contrary to the predominant focus on resistance movements and conflicts, my findings reveal that not all groups resist extractive conflicts, and even those that do often experience internal divisions. My research has advanced to explore the social responses and governance of extraction of transition minerals for the energy transition (also known as green extractivism). I have explored the governance of deep-sea mining (DSM) as well as key minerals like nickel. Pioneering research linking post-extractivism and degrowth I argue for the need to reduce energy and material consumption in a fair and democratic manner.

My research has been developed through international collaborations with renowned researchers, By leading as PI, Co-PI or as workpackage leader in 9 national and international research projects, I've demonstrated proficiency in managing projects and coordinating research groups and joint publications. Demonstrating leadership, I won competitive research projects Recercaixa-ACUP 'Activism Mobilising Science' project as Co-PI, the EU funded Marie Skłodowska Curie fellowship and the I3 certification from Ministerio de Universidades. Through these projects I have consolidated an independent research line, organised special issues, webinars and workshops. This high-impact social research has been published in Q1 Social Sciences journals where I am first author in 8 of 15 publications, I've led 2 special issues, written 4 book chapters, and presented research in 22 scientific conferences and workshops globally, organised 2 seminar series, and the 2nd international conference on Degrowth in 2010.

To disseminate knowledge to non-academic audiences, I directed and produced a documentary, wrote 4 dissemination blogs and articles, organized 6 workshops with affected communities.

Training and mentoring includes supervision of 2 PhD (Mexico-FLACSO and ICTA-UAB) and 5 Master students, as well as 3 PhD committees and 8 master panels. I co-design and founded in 2017 the Master program at ICTA-UAB on Political Ecology, specializing in Degrowth and Environmental Justice, the online Master Program that started in 2022 and the summer courses on Political Ecology in the 2011, 2012, 2015 and 2017 editions. I am the coordinator and teacher of the Political Ecology module having also participated in other teaching courses and summer courses. My capacity to adapt to different environments (activist, academic, NGO, advocacy) has allowed me to combine my interest in environmental activism with action research striving to create impact. I am particularly proud of the research published in The Guardian and communicated by The London Mining Network at the Rio Tinto AGM, that put pressure on this big miner to conduct an epidemiology study on the health of its workers in Namibia.

**Área Temática:**      **Ciencias sociales**
**Nombre:**             RUBIO GRUNDELL, LUCRECIA
**Referencia:**         RYC2023-042619-I
**Correo Electrónico:** lucrecia.rubio.grundell@gmail.com
**Título:**             Gender Equality and LGBTI rights in the European Union

**Resumen de la Memoria:**

Since defending my PhD in Political Science at the European University Institute in November 2018, which was shortlisted for the 2021 ECPR Joni Lovenduski PhD Prize in Gender and Politics, I have produced 9 indexed publications: a single-authored book, five single-authored articles in Q1/Q2 journals (Gender Studies and Political Science) and co-authored chapters and articles with leading scholars in top international and national journals and editors. These have made pioneering contributions to EU Gender Studies, Critical Security Studies and Morality Politics, advancing a unique research agenda that integrates such literatures to analyse controversial feminist and LGBTI issues, using innovative qualitative discursive methods to develop unparalleled empirical analyses. I have disseminated my research in over 25 of the main international and national conferences in my fields, and given various invited talks, including at the European Parliament and the State of the Union Conference.

My academic career has evolved across four countries, seven research groups and six national and international projects. These include (i) the Gender and Politics (GEYPO) Research Group at UCM, where I am currently Principal Investigator of my own project as MSCA-COFOUND-UNA4CARRER fellow, on the opposition against gender equality and LGBTI rights at EU level (OppGen+EU). The latter is innovatively focuses on the EU itself and issues controversial feminist and LGBTI issues (ii) The Atélier de Genre(s) et Sexualité(s) at ULB, where I was visiting research in 2023. (iii) Formerly, I was team member at the UCM for the H2020 UniSAFE project, to which I contributed with my expertise on the EU's violence against women policies, my experience in qualitative analysis and my language skills, developing the case studies in Spain and Italy. (iv) At the UNESCO Chair in Human Rights and Interculturalism at UNIA, I applied for an Erasmus+ Jean Monnet Actions Grant, attaining over 50,000€ for the DEDEMOC project, in which I organised two international conferences on the rise of opposition against gender+ equality in Europe. The results were the consolidation of an international research network and seminal publications on the matter. (v) In the International Relations Research Group (GERI) at UAM, I was team member of the Women on the Move project, in which I participated in obtaining 30,000€ from the Madrid City Council and was responsible for all its research and organisations tasks, including supervising the graduate students involved. (vi) At the Centre d'Etude de la Vie Politique (CEVIPOL) at ULB, I was team member of the ValEUR project, where I developed the research line on European Morality Politics, adding a gender perspective. (vi) Finally, in 2016 I was visiting researcher at the School of Security Studies, King's College London.

I have also contributed to knowledge transfer, especially to EU institutions, as an expert in studies ordered by several of them, and have over 6 years of teaching and mentoring experience. In 2017 I was invited to teach a seminar on EU Gender Studies at Dusseldorf University. I have also taught EU Gender Studies at the EU Master at ULB, qualitative methods at UCM and UAM, on trafficking at UAM and UNIA and the BA Gender and Politics course at UCM in 2023. I have also directed a Master thesis (Glasgow University) and a BA thesis (UCM).

**Resumen del Currículum Vitae:**

I am a Marie Sklodowska-Curie Actions Postdoctoral Fellow at the Political Science Department at UCM, where I am Principal Investigator of my own project on the opposition to gender equality and LGBTI rights at EU level (OppGen+EU). I obtained my PhD in Political Science at the European University Institute in November 2018, for which I received a competitive 4 year PhD grant from the Swedish Research Council. My thesis innovatively combined EU Gender Studies and Critical Security Studies to analyse the EU's anti-trafficking policies and was shortlisted for the 2021 ECPR Joni Lovenduski PhD Prize in Gender and Politics. I have 9 indexed publications: a single-authored monograph, five single-authored articles in Q1/Q2 journals and co-authored articles and chapters with leading scholars in high-ranking international and national journals and editorials. These have made ground-breaking contributions to EU Gender Studies, Critical Security Studies and Morality Politics, advancing a unique research agenda that integrates such literatures to study controversial feminist and LGBTI issues.

As a postdoctoral researcher I have participated in 6 international and national research projects: as PI of OppGen+EU at UCM; as team member in the H2020 UniSAFE project at UCM, to which I contributed with my former experience in qualitative methods and language skills, doing the case study in Spain and Italy; in the Women on the Move project at UAM, I took part in applying for funding, obtaining 30.000 € from the Madrid City Council and was responsible for all of its organisational and research tasks, including supervising the graduate students involved and drafting and disseminating all its outputs; in the DEDEMOC project at UNIA, I applied for the Erasmus+ Jean Monnet Actions Grant, obtaining 54,000 € to organise two international conferences on the opposition against gender+ equality in Europe, which I organised and attended, consolidating my expertise on the matter and forming part of the international network that resulted; in the valEUR project at ULB, I developed the research line on Morality Politics at EU level, adding to it a gender perspective that was missing. The result were two cutting-edge publications with the PI, François Foret, a prominent scholar in EU Studies. Finally, I was a hired researcher as a national expert in the H2020 CASPER project, to map the legal framework and certification-award system in Spain. I have contributed to knowledge transfer, especially to EU institutions, as a national expert in various studies commissioned by the European Parliament, the European Commission and the European Institute of Gender Equality.

In 2016 I was visiting researcher at King's College London and in 2023 at the Atélier de Genre(s) et Sexualité(s), ULB. I have presented my work in over 25 international and national conferences and have given several invited talks including at the European Parliament and the State of the Union conference. I have over 6 years of teaching and mentoring experience. In 2017 I was invited to teach a seminar on EU Gender Studies at Dusseldorf University. I also taught EU Gender Studies at the EU Studies Master at ULB, on qualitative methods at UCM and UAM, on trafficking at UAM and UNIA and the BA Gender and Politics course at UCM in 2023. I directed a Master thesis at Glasgow University and a BA thesis at UCM.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

**Área Temática:** Ciencias sociales
**Nombre:** SALVO AGOGLIA, IRENE AMALIA
**Referencia:** RYC2023-043875-I
**Correo Electrónico:** irenesalvo@gmail.com
**Título:** Investigación interdisciplinaria en protección de la infancia y adopción

**Resumen de la Memoria:**

Trabajo en la intersección de la investigación entre los estudios sociales de infancia, los derechos del niño y los estudios interdisciplinarios sobre adopción. Mi compromiso con la construcción de puentes interdisciplinarios e intersectoriales entre múltiples actores en el campo de las políticas públicas, las intervenciones y la investigación ha sido un sello distintivo de mi carrera académica. Mi trabajo ha sido destacado en el campo de la investigación sobre la adopción en América Latina. En particular, he profundizado en la compleja aplicación política y práctica del derecho a vivir en familiar, derecho a la identidad y del principio de participación, examinando los aspectos subjetivos implicados en la construcción de los orígenes y la identidad en distintos actores implicados en los procesos adoptivos. Asimismo, he explorado y visibilizado académica y políticamente la grave problemática de las "adopciones irregulares" en Chile. Me interesa proponer un nuevo marco conceptual, metodológico y ético a través del cual fortalecer la apertura y la participación de las personas adoptadas en la investigación, las políticas y las prácticas de adopción. En particular, me he especializado en investigación narrativa, creativa y basada en arte para nutrir la comprensión de los fenómenos que indago, así como la agencia de las personas adoptadas, mediante diseños basados en la co-investigación. Como Investigadora Principal, he dirigido tres proyectos (FONDECYT 11200491, FONDECYT 3170338 y Proyecto REDI170133) financiados por la Agencia Nacional de Investigación y Desarrollo (ANID/Chile), coordinando equipos compuestos por investigadores predoctorales, ayudantes de investigación e investigadores senior extranjeros. Asimismo, he sido investigadora asociada y Co-IP de números proyectos y consultorías especializadas en el campo de la protección de la infancia, cuidados alternativos y adopción. Además, soy investigadora asociada a 3 Grupos de investigación (dos basados en España y uno basado en Brasil). En marzo de 2023, dejé mi puesto permanente en Chile como profesora titular en Chile para asumir una posición de investigadora postdoctoral Beatriu de Pinós (AGAUR). Durante el primer año de este contrato, adjudiqué una Marie Curie Fellowship en la Universidad Autónoma de Barcelona (UAB). Además, en 2023, me acredité como profesora lectora y agregat por AQU Catalunya. Actualmente, aspiro a consolidar y estabilizar mi posición en el espacio español y europeo de investigación solicitando el contrato Ramón y Cajal.

**Resumen del Currículum Vitae:**

Soy psicóloga (Universidad de Chile), Master (Universidad de Santiago de Compostela y Doctora en Psicología (Universidad de Buenos Aires). Desde que me doctoré en 2016, he producido 24 artículos (en inglés, español y francés), 22 de los cuales han sido publicados y 2 aceptados en revistas revisadas por pares (a publicar en 2024), así como 9 capítulos de libros, 1 libro editado y 1 libro de divulgación en coautoría con participantes de una de mis investigaciones (SANKOFA) (327 citas, 268 desde 2019, índice h: 11, índice i10: 13 en Google Scholar). En 2023, me incorporé en el Editorial Board de la revista Adoption Quarterly (SJR, Q2), siendo la única investigadora de un país hispanohablante en el mismo. He asistido a 58 Conferencias nacionales e internacionales (por ejemplo, ASAC, LASA, AFIN, ICAR, EUSARF) y co-organizado una amplia gama de reuniones científicas, incluyendo mesas redondas, seminarios, paneles y talleres de postgrado, principalmente en España, Argentina y Chile. Además, he sido invitada como principal key speaker a 3 eventos internacionales. La docencia es otro componente crucial de mi perfil académico y está íntimamente entrelazada con mi experiencia profesional e investigadora, especialmente con estudiantes de grado, máster y profesionales de la adopción. Desde 2004, he ejercido la docencia a nivel de pregrado, magíster y doctorado en Psicología, Trabajo Social, Antropología y Derecho, así como en diplomados interdisciplinarios. He dirigido 11 tesis de Master. Entre 2018 y 2022, tutoricé a estudiantes del Doctorado en Psicología de la Universidad Alberto Hurtado (Chile), en la elaboración de publicaciones científicas indexadas y la elaboración de proyectos de investigación competitivos). También he sido miembro del tribunal examinador de 1 estudiante de doctorado (Chile) y examinador externo de dos estudiantes para obtener su doctorado internacional (España). He acogido a decenas de investigadores invitados en Chile y España en el marco de proyectos de investigación que he liderado. A nivel técnico especializado, fui asistente técnica y consultora en la ONG RELAF (2015-2016, Argentina) y he realizado diversas consultorías con organismos internacionales como UNICEF, contribuyendo a la construcción de políticas públicas de protección a la infancia, acogimiento familiar y adopción en Chile y otros países de América Latina. A nivel de políticas públicas, fui miembro del Primer Consejo Consultivo de la Defensoría de la Niñez de Chile (2019-2021) y he participado activamente desde 2018 en el debate parlamentario de la actual reforma de la ley de adopción en Chile. Asimismo, he diseñado campañas de difusión (Mes Nacional de la Adopción, 2022), aparecido en medios de comunicación y publicado recursos para profesionales, responsables políticos, personas adoptadas, familias adoptivas y público en general. Mi trayectoria demuestra mi versatilidad para trabajar con éxito con diferentes grupos y mi independencia para establecer colaboraciones y agendas de investigación

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | TORAL MARTÍNEZ, GUILLERMO |
| **Referencia:** | RYC2023-042505-I |
| **Correo Electrónico:** | guillermo.toral@ie.edu |
| **Título:** | Relationships among state actors –politicians, bureaucrats, and anti-corruption agents–and their impacts on public service delivery, human and economic development, and democracy |

**Resumen de la Memoria:**

After developing a 13-year academic career abroad (with stays at the Oxford, the World Bank, MIT, Harvard, and Vanderbilt) I seek to establish myself a consolidated researcher in my field, with the corresponding official accreditation and ideally with tenure at a top social science department in Spain. I plan to continue publishing in top journals, teaching and advising students, obtaining and managing grants, building and nurturing networks, and disseminating results to academic and policy audiences.

The general objective of my research agenda is to examine political dynamics among key state actors (politicians, bureaucrats, and anti-corruption agents) and their impacts on public service delivery, on political competition, and on human as well as economic development, in a variety of geographic and political contexts, to shape academic as well as policy debates around governance and corruption. To measure these dynamics and their effects, I use a combination of big administrative datasets, original surveys of bureaucrats and politicians, fieldwork, experiments (natural, field, and survey), and machine learning techniques. By combining cutting-edge methods, I seek to provide credible and reliable answers to relevant questions on issues of governance, corruption, and development. Empirically, most of my work today centers on Brazil and Spain – the goal now is to expand to other countries in Latin America and in Southern Europe, including Colombia, Mexico, and Italy.

A first block in my research agenda examines the political uses of public employment, their rationale, and how they shape corruption and service delivery. This builds on my award-winning PhD dissertation and related papers on the Brazilian case. The main goal of this block is to produce an academic book and to publish it with a top press. The book will go well beyond what is in the papers and the dissertation, by (i) articulating a formalized theory of why and how politicians manipulate public employment, what consequences it has, and the successes and failures of anti-patronage policies; and (ii) collecting and presenting data from a diverse set of cases.

A second block in my research agenda examines anti-corruption agencies, actors, and policies. I seek to advance theoretical and policy debates through a multi-country, multi-disciplinary, and multi-method study of anti-corruption institutions, seeking to understand (i) what makes anti-corruption institutions effective at detecting, punishing, and deterring corruption; and (ii) what effects strong anti-corruption institutions have on governance outcomes. I will be paying particular attention to anti-corruption agents, and how their selection, deployment, and incentives shape their behavior; and examining positive as well as undesirable effects of anti-corruption agencies on service delivery, the quality of governance, and political competition.

A third block in my research agenda focuses on elite civil servants who play key functions at the core of state capacity, including judges, prosecutors, notaries, tax inspectors, military officers, and police officers. By collecting and analyzing detailed administrative data on the selection, careers, and performance of these civil servants, I seek to understand the micro-level bureaucratic politics of how states produce order, extract resources, and maintain the rule of law.

**Resumen del Currículum Vitae:**

I am a researcher in comparative politics and political economy, with a focus on governance, corruption, and development. In particular, my research centers on relationships among key state actors –politicians, bureaucrats, and anti-corruption agents–and their impacts on public service delivery, human and economic development, and democracy. I am passionate about uncovering the internal political dynamics of the state and their profound effects on what governments do and on citizens' welfare.

I am currently an Assistant Professor of Political Science at IE University, and a Faculty Affiliate at MIT GOV/LAB, a research center at MIT (USA). I grew up and went to college in Madrid, and then spent 13 years developing an international research career – I did a 2-year masters at the University of Oxford, spent 2.5 years as a staff member of the World Bank, completed a PhD in Political Science at MIT, and worked as a tenure-track Assistant Professor at Vanderbilt.

My research agenda consists of three main blocks. A first block examines the political uses of public employment, their rationale, and how they shape corruption and service delivery. A second block examines anti-corruption policies, the conditions under which they succeed, and the bureaucratic politics that underpin them. A third block examines the selection and careers of civil servants at the core of state capacity, including judges, diplomats, and prosecutors. Methodologically, I use a combination of big administrative datasets, surveys, qualitative fieldwork, and experiments (natural, field, and survey) to build and test theories that improve our knowledge of governance, corruption and development.

Some of my research has been published in some of the top journals in the discipline, including the American Journal of Political Science, the Journal of Politics, and the Annual Review of Political Science. I have published 5 peer-reviewed articles (3 of them solo-authored, and 4 of them in Q1 journals), 2 chapters in a peer-reviewed book, 1 book review, and 3 policy reports. My research has 1,279 citations on Google Scholar with an h-index of 9.

Additional evidence about the discipline's recognition of my expertise and contributions comes from grants, awards, invited talks, and peer reviewing. My research has been supported by a variety of funders, which in total have provided about €150,000 to support research projects led by me. Some

of my work has received disciplinary awards, including 3 dissertation awards (one of which from APSA), and best paper awards for 3 different articles. Over the past 5 years, I have delivered 23 invited talks at institutions in the USA, Europe, Latin America, and Asia. I am regularly invited to peer review by top journals – I have delivered 43 referee reports.

I firmly believe in the importance of making social science research useful to government agencies, civil society organizations, and society at large. Motivated by this conviction, I actively engage in disseminating my research to policymakers and delving into conversations about my findings with journalists.

In sum, I am a young researcher who recently moved back to Spain, where I continue to develop an international academic career by conducting impactful research, publishing in top journals, advising students, and contributing to theoretical and policy debates about governance.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | KIRATLI , OSMAN SABRI |
| **Referencia:** | RYC2023-043198-I |
| **Correo Electrónico:** | osmansabrikiratli@gmail.com |
| **Título:** | Explaining the Determinants of Public Opinion on International Cooperation and Conflict |

**Resumen de la Memoria:**

My academic expertise covers subjects on International Organizations, International Political Economy, Political Behavior, Foreign Aid, as well as European Union and Turkish politics. My primary research areas are public opinion on international cooperation and conflict. Regarding international cooperation, I focus on three issue areas: foreign aid, international organizations (IOs), and international trade. In my research on interstate conflict, I explore the dynamics of citizen attitudes toward the use of force and military interventions. Methodologically, my works often utilize quantitative analysis on cross-sectional data to analyze mass attitudes in a number of countries comparatively and survey experiments to uncover the causal mechanisms on the drivers of individual preferences. I have empirical skills covering survey collection (face-to-face, online), experiments (conjoint, vignette, factorial designs), and advanced statistical methods (structural equation modeling, multi-level designs).

I have 18 SSCI-indexed, published or forthcoming articles and additional four peer-reviewed articles in journals covered by area indexes. Eighteen of these publications are solo-authored, and, of the remaining four, in two, I am the lead author. Thirteen of my SSCI publications are published in Q1 journals and five are in the top-15 journals of Political Science. My publication highlights include articles in journals such as Political Behavior (x2), the Review of International Organizations (x2), European Journal of Political Research, European Union Politics (x2), Public Opinion Quarterly, JCMS: Journal of Common Market Studies, Party Politics, Political Studies, and International Journal of Public Opinion Research. As a demonstration of my prolific research output, throughout my career, I have received several research grants and awards, ranging from Young Scientist Award (BAGEP) at the national level to Humboldt Research Fellowship for Experienced Researchers and Jacqui Briggs Prize at the international level.

In my works on public attitudes on IOs, I investigate the conditions under which citizens form their preferences on international organizations and the extent to which the domestic economic and political conditions moderate these preferences. Besides the individual paper projects, as part of this research agenda, currently I am working on a grant proposal to be submitted to ERC on external perceptions of the EU. Specifically, in this project, I plan to analyze citizens' attitudes toward the EU in developing and underdeveloped countries where the EU pursues an active foreign policy through either foreign aid disbursements or participation in humanitarian and peacekeeping missions and operations. I believe the academic environment to which I will be exposed as a result of Ramón Y Cajal fellowship will significantly assist in strengthening my arguments in my research.

**Resumen del Currículum Vitae:**

I received my undergraduate degree from Sabanci University, Istanbul, with full scholarship and hold a PhD degree in Political Science in the track of International Relations from the University of Massachusetts Amherst, USA, awarded in September 2012 with my dissertation titled "Why Sacrifice Sovereignty? A Non-Instrumental Explanation of State Support for Supranational Cooperation in EU Common Foreign and Security Policy". Currently, I work as an associate professor of International Relations and Political Science in International Trade Department of Bogazici University, Istanbul.

I have 18 SSCI-indexed, published or forthcoming articles and additional four peer-reviewed articles in journals covered by area indexes. Eighteen of these publications are solo-authored, and, of the remaining four, in two, I am the lead author. Thirteen of my SSCI publications are published in Q1 journals and five are in the top-15 journals of Political Science. My publication highlights include articles in journals such as Political Behavior (x2), the Review of International Organizations (x2), European Journal of Political Research, European Union Politics (x2), Public Opinion Quarterly, JCMS: Journal of Common Market Studies, Party Politics, Political Studies, and International Journal of Public Opinion Research. Besides these, I have two papers under review, all in the second round. I take particular pride in producing such high-quality research in a teaching-oriented department with no Ph.D. program, in a Turkish public university with extremely scarce research funding, minimal feedback and networking opportunities, limited academic freedom, and constant protests and police presence in the last three years.

As a demonstration of my prolific research output, throughout my career, I have received several research grants and awards. To highlight, in 2020, I was awarded Young Scientist Award (BAGEP) in the discipline of Political Science and International Relations from Science Academy, Turkey. In 2021, I received the highly competitive Humboldt Research Fellowship for Experienced Researchers from the Alexander von Humboldt Foundation. As a part of this fellowship, I spent between January 2022 and June 2023 at WZB Berlin Social Science Research Center, Global Governance Research Unit. In 2022, my work was recognized with the Jacqui Briggs Prize for the best article published in the European Political Science journal in 2021. In 2023, I am offered a 3-year research fellowship at Waseda University, Waseda Institute of Advanced Study, Tokyo, Japan.

Additionally, I have received four major research grants from the Scientific and Technological Research Council of Turkey and my university. I have also cultivated an active presence in the European political science community, having participated in more than 30 academic conferences, with several of them being funded or invited, and reviewed for more than 15 international academic journals. Currently, I am also an active member of ECPR (European Consortium for Political Research).

Additionally, I have also held leadership positions. I have served as a department head for almost two years, as the founding coordinator of a Master's program, "International Trade and Competition" for four years, and frequently taken part in university-level committee duties, including the head of Ethics Committee in Social Sciences.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | DEN HOED , ABRAHAM WILLEM |
| **Referencia:** | RYC2023-042958-I |
| **Correo Electrónico:** | wilbertdenhoed@me.com |
| **Título:** | Contemporary urban challenges in mobility and sustainable development |

**Resumen de la Memoria:**

After building a promising profile around the topical subjects of urban mobility transformations and population ageing, I propose to extend my current research lines with a focus on three avenues that caught recent societal and scientific attention: 1) sustainable mobility and the inclusion of underrepresented groups; 2) the insertion of age-friendly approaches into urban research; and 3) an integrated approach to the environmental, social, and health aspects of urban living and their governance implications. These lines result from the recent reconfigurations which accelerated in the wake of the COVID-19 pandemic and incremental trends such as demographic change, ageing, and climate change effects. The changing geographies of sustainable mobility opportunities for urban populations will reconfigure the urban landscape in terms of spatial uses and mobilities of all city users, which demands flexible and innovative territorial governance systems.

I intend to reach the development of these research lines by building on my experience of implementing funded research and acquisition of highly competitive funding for individual and collaborative projects. I have a strong record of multi-method and multi-disciplinary research, and of ethical working standards, community engagement, and co-creative approaches with the societally relevant target groups that I study. Among others, I have successfully executed survey research, qualitative, biographical, and mobile methods, and corresponding mixed-method analyses. I further benefit from ample postdoctoral and educational experience gathered in three countries and at institutions with excellent track records. Counting on strong methodological and conceptual foundation, including frameworks such as the Age-friendly City and 15-Minute Cities, I believe I can make a meaningful contribution to current and future scholarship about present urban (mobility) transitions and their impacts on vulnerable communities and territories.

I am confident that my research and academic trajectory attests to my ability to work independently and implement research plans proactively. A fellowship such as Ramon y Cajal depends on the execution of research plans over an extended period, which would allow me to apply my national and international networks and know-how on working with academics and governance actors in the present urban sustainability transitions that I propose to study. I would use the resources of this fellowship and my accumulated expertise and knowledge to pursue academic and societal interests in the topical areas of urban geography, mobility, and ageing studies. I would address these topics through engaging with current international academic debates and through identifying local challenges, with the aim to make impactful scientific and societal contributions.

**Resumen del Currículum Vitae:**

Dr Wilbert den Hoed is a Postdoctoral Researcher at the Department of Urbanism of TU Delft and a Substitute Professor at the Department of Geography at the Universitat Rovira i Virgili (URV, Spain). Until 2023, Dr den Hoed held a Marie Sklodowska-Curie Actions (MSC) fellowship at URV and gained additional postdoctoral research experience at the European Policies Research Centre (EPRC) of the University of Strathclyde (2018-2021). He holds a PhD in Human Geography from Newcastle University (2018) on the topic of urban cycling among ageing populations. During his (post)doctoral appointments, he has won various competitive grants including a PhD scholarship on the project MyPLACE (Mobility and Place in the Age-friendly City) and his MSC fellowship.

During his (post)doctoral appointments, Dr den Hoed has developed into an all-round and internationally skilled geographer with strong subject knowledge on urban mobility and social inclusion challenges. He has a distinctive academic flexibility, having worked in multiple interdisciplinary research and policy consultancy environments. His research skills span a range of methodologies, including quantitative and qualitative techniques, documentary research, and methods that capture mobile experiences. Dr den Hoed also has three years of experience on the analysis of policy and governance around sustainability transitions at urban, regional, and EU policy levels, analysing associated strategies and creating multiple outputs based on research commissioned by public institutions.

His present research lines relate to the transitions of the urban environment, (new) mobility systems, and their accessibility to different urban populations. His works cover a variety of topics in mobilities research, geography and urban studies and follows renowned frameworks such as the Age-friendly City and the 15 Minute City. These lines come together in his newest project 15minESTATES, which studies the sustainable transport options and mobility needs for the case of large-scale housing estates. Simultaneously, he is involved in analysis and dissemination of four recently concluded research projects about urban mobilities, tourism, and social inclusion. Besides his own MSC-project and 15minESTATES, Dr den Hoed has participated in 15 (inter)national research projects and five knowledge transfer networks which present academic research to policymakers at urban, regional, and (supra)national levels. He is the lead author of 9 scientific publications, six forthcoming peer-reviewed publications, and has presented his work at 41 (inter)national conferences in the fields of Geography, Urban Planning, Mobilities and Tourism studies.

Dr den Hoed has trained and mentored young researchers since 2015, an educational commitment he strengthens during his current appointment at the URV. He is also part of organisation committees and scientific steering groups (ATLAS, RGS-IBG), while he has created an international reputation through fieldwork collaborations in Rotterdam, Delft, Newcastle, Barcelona, and Venice and as visiting researcher at the University of Manchester and the Open University of Catalonia. He habitually disseminates his ideas and outputs in multiple languages through scientific publications, consultancy reports, and academic events, while having a track record of impactful policy and civic society contributions.

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| **Área Temática:** | Ciencias sociales |
| **Nombre:** | LYNCH , CASEY RYAN |
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| **Correo Electrónico:** | lynchcaseyr@gmail.com |
| **Título:** | Democracy and the Aesthetic Politics of Urban Artificial Intelligence |

**Resumen de la Memoria:**

I am an urban, political, and digital geographer. My work employs ethnographic and participatory methods to examine the role of emerging digital technologies in everyday urban life, highlighting how they enable new relationships of power and control, as well as opportunities to imagine alternative urban futures. With support from several competitive internal and external funding sources, my research has been organized in three major research lines. Different projects have examined the politics of techno-utopian urbanism; community technology and alternatives to the smart city; and the geographies of AI and robotics.

My work on the politics of techno-utopian urbanism has focused on two empirical case studies. The first case, which was the focus of my Master's thesis (2015) and subsequent articles in Political Geography (2017) and Urban Geography (2019), is the Zone of Employment and Economic Development (ZEDE), a proposed autonomous jurisdiction and smart city in Honduras. My research on this case has interrogated the libertarian capitalist ideology inspiring the project, as well as the impacts of the project on local communities fearing displacement. The second case examined a proposed semi-autonomous jurisdiction and blockchain-based smart city in Nevada, USA, tracing the coming together of digital and territorial models of libertarian secessionist imaginaries (Progress in Human Geography, 2023). Overall, this research line has made interventions in literatures around greenfield urbanism, neoliberalism, democracy, and feminist geopolitics.

A second research line investigated possible alternative models of urban digitalization, beyond corporate-driven smart city imaginaries. This work formed the basis of the my PhD dissertation (2019) and subsequent publications in Antipode (2020), Digital Geography and Society (2020), and Regional Studies (2021). Empirically, the research examined the practices and values informing the work of community technology collectives in Barcelona pursuing "technological sovereignty"—grassroots forms of open-source digital development, often within solidarity economy frameworks. Based on ethnographic research, this work intervened in scholarly debates around smart cities, digital commons, digital citizenship, and posthuman agency.

A third research line examines the geographies of AI and robotics. This has included theoretical writing around the meaning of human and machine intelligence (Annals of the American Association of Geographers, 2020), as well as empirical cases about the integration of emotion in AI and robots (Space and Polity, 2021), and the use of AI in real estate (Artificial Intelligence and the City, 2023) and care work (Annals of the American Association of Geographers, 2022). This work has also included an ongoing collaborative project funded by the US National Science Foundation examining the development of social robots for use as museum tour guides. Over the next five years, I will continue this research line, shifting focus to specifically urban applications of AI, investigating their impacts on practices of urban democracy. I will conduct ethnographic research to trace how AI applications are materialized and "felt" differently within cities, in the process shifting key sites of decision-making with implications for political struggles over resources, planning, and justice.

**Resumen del Currículum Vitae:**

I am an urban, political, and digital geographer with over ten years of research experience at universities in the United States, Spain, and the Netherlands. From 2013 to 2019, I completed my MA and PhD in Geography with a minor in Gender and Women's Studies at the University of Arizona. During that time, I also spent two years a pre-doctoral visiting scholar at Universtat Pompeu Fabra in Barcelona, Spain, conducting ethnographic research on community technology collectives in the city. Since completing my PhD, I have spent three years as an Assistant Professor in the Department of Geography at the University of Nevada Reno in the United States, and two years as an Assistant Professor in the Section of Knowledge, Transformation, and Society (KiTeS) at the University of Twente in the Netherlands.

Across these experiences, I have published 14 articles in top-ranked international journals and 2 peer-reviewed book chapters—all as sole, first, or co-first author. This includes articles in journals like Progress in Human Geography, Annals of the American Association of Geographers, and Antipode. As of this writing, these works have been cited 326 times (Google Scholar) with 122 of those citations in the past year alone, demonstrating a rising research profile. Several of these papers have also received prestigious awards, such as the Early Career Researcher Prize from the journal Urban Geography, the Editors' Choice Award from the journal Digital Geography and Society, and student paper awards from the specialty groups on digital and political geography from the American Association of Geographers.

I have received competitive research funding as the principal investigator from several major organizations, including a Fulbright Student Award, a Dissertation Proposal Development Fellowship from the Social Science Research Council, a Fieldwork Grant from the Wenner-Gren Foundation, and a major grant from the US National Science Foundation programs on Science and Technology Studies (STS) and Advanced Informal STEM Learning (AISL). The first three of these supported my PhD dissertation research and research stay at Universitat Pompeu Fabra. The last of these is a three year (2021-2024) collaborative, interdisciplinary project involving myself, a roboticist, a digital artist, and the directors of two museums in Reno, NV, USA. The project explores the socio-spatial dimensions of evolving forms of human-robot interaction. I was PI of the project from its inception until my relocation to the Netherlands.

As a teacher and mentor, I currently serve as the co-supervisor of a PhD student at the University of Twente, and previously served on advisory committees for three completed PhDs at the University of Nevada Reno. In addition, I have supervised five completed Master's theses, with three others currently in progress.

Beyond academia, I have aimed to disseminate research findings to broad public audiences. This has included giving presentations to NGOs and civil society organizations like the National Lawyers Guild and the International Alliance of Inhabitants, as well as interviews to journalists from La Vanguardia, the Nevada Independent, and the Las Vegas Review Journal. I have also been featured as a guest on several podcasts and radio programs and published several public blog posts about my research.

**Área Temática:** Ciencias sociales
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**Título:** Digital Media and Education

**Resumen de la Memoria:**

I am currently one of the fastest-growing researchers in the field of Sociology of Communication and my academic production is positioned at the same level as that of established professors. I have been acting as an evaluator for major national and international funding agencies (Dutch Research Council and European Research Council) and I am currently co-leader of an EU COST Action. Throughout my career, I have worked in four different countries (UK, Italy, Brazil and Israel), obtaining national and international research grants, and participated in two global research projects (more than 40 countries). In the last 5 years, I co-authored a monography (McGill-Queen' s University, 2022), co-authored an edited volume (Edward Elgar, 2023), published 3 book chapters and 11 academic articles, 8 of which in Q1 international communication journals and 2 currently under publication.

My career path has been multidisciplinary in nature and global in scope, and yet always oriented towards a critical analysis of the link between digital media and education. From local resistance movements to large-scale religious organizations, my work investigated the intersection of identity politics and media entrepreneurship to shed light on how digital communication campaigns were designed to circulate information, mobilize networked publics, and eventually renegotiate power on the ground. Embarking on my academic journey, my PhD research focused on the media strategies of resisting Palestinian communities, revealing the transformative impact of online video-sharing platforms. Postdoctoral endeavors expanded this trajectory, investigating Catholic media enterprises' global influence in politically charged regions and examining how Brazilian religious media navigated the COVID-19 pandemic. Based at the University of Haifa, the first study uncovered how the strategic mediatization of holy sites was functional in forming global networks of believers with significant social and economic sway. The second study, conducted at the University of Cambridge and with the support of the Pontifical Catholic University of Sao Paulo, explored the communication strategies of some Brazilian religious media outlets during the pandemic, exposing clashes between global and local epistemic authorities and efforts to insulate communities from scientific information.

Since joining the Institute for Media and Journalism at the Università della Svizzera Italiana, my research on digital media and education has significantly expanded in both size and scope. Currently, I play a key role in the Core Management Group of an EU COST Action involving more than 40 countries, and I co-lead the Swiss team in the Global Media and Internet Concentration Project. Additionally, I have established an international research team focusing on media education policies and, as part of two national teams (Italy and Switzerland), I have supported the implementation of innovative computational methods in the fields of Digital Education and Media History.

In the coming years, I plan to expand my research by exploring how various visions of the global future are strategically appropriated and promoted by tech giants, and their subsequent impact on state sovereignty, policymaking, and education.

**Resumen del Currículum Vitae:**

I am currently a Research Fellow and Lecturer at Institute of Media and Journalism (Università della Svizzera Italiana), where I teach Sociology of Communication, Critical Theory and Computational Methods for the Social Science. My research explores the intersection of media futures, education, and social change, a trajectory I have pursued at both the University of Cambridge and the University of Haifa

My entire academic career has been supported through competitive research funding which I obtained by personally designing innovative and viable research projects. This included the development of Ethical Guidelines, Research Budgets, Data Management Plans and Project Management Protocols. I was first awarded a prestigious PhD scholarship from the Italian Institute of Humanities (3 years) and, after receiving my PhD in 2014, I was invited to join a multi-institutional research project financed by the Israeli Centre of Research Excellence (I-CORE). Subsequently, I won a three-year grant from the Israeli Science Foundation (Individual Fellowship, 34% success rate) and a minor grant from the Cultural Office of the Embassy of Israel. Finally, with the support of the University of Cambridge and the Pontifical Catholic University of São Paulo, I obtained a three-year Marie Curie Global Fellowship from the European Commission (14.3% success rate).

My studies have been published in several Q1 international journals of communication and were part of the 2021 Research Excellence Framework (REF) evaluation for the University of Cambridge, where they received a score of 4 out of 5. Over the last five years, I published 7 articles in top-rated international communication journals and 6 articles in Q2 or national communication journals. This included studies on the online communication strategies of indigenous media organizations (New Media & Society and Convergence) and several works on the corporate and promotional culture of religious digital enterprises (Information, Communication & Society, The Communication Review and Journal of Media and Religion). As an expert in text-mining and critical discourse analysis, I co-authored a series of papers on critical policy analysis that have been published in Q1 international journals, such as the British Journal of Sociology and Compare. I recently co-authored a monography on the digital strategies of religious media enterprises (McGill-Queen's University Press, 2022) and co-edited a volume on media platforms and higher education in times of crisis (Edward Elgar Publishing, 2023).

I am currently part of 4 international research teams, two of which involve scholars from more than 40 countries around the world. I am co-leader of a COST Action that aims to trace how the rise of nationalisms in Europe threatens academic freedom and member of Global Media and Internet Concentration Project, a large comparative study that aims at tracing media concentration on a global level. Results are circulated among policymakers and stakeholders in the form yearly reports. I serve as an evaluator for both the Dutch Research Council (NWO) and the European Research Council (ERC), as well as reviewer for more than 10 top-rated academic journals.

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| **Área Temática:** | Ciencias sociales |
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| **Título:** | Penalidad contemporánea con perspectiva feminista |

**Resumen de la Memoria:**

I have established a distinguished academic career as a sociologist and political scientist, specializing in the study of contemporary manifestations of the state's penal power, with a particular focus on prisons and immigration detention. I employ a gender lens in analyzing these subjects. After completing my PhD thesis on women's imprisonment with a focus on gender equality policies, I broadened my research scope to include new topics, such as immigration detention, while introducing innovative approaches to studying gender and prison systems. Both research lines have been supported by projects where I served as the principal investigator. In the realm of immigration detention, my first post-doctoral contract, a Marie Sklodowska-Curie Individual Global Fellowship (MSCA-GF) (2018-2021) at the University of Toronto (Canada) and the University of A Coruña (Spain), allowed me to conduct a groundbreaking analysis of the transformation of immigration detention systems in Spain and Canada. The MSCA-GF project, Governmigration, explored the governance of irregular migration through detention, yielding significant contributions to the scholarship, including publications, special issues in renowned journals, international workshops, funding acquisition, and the development of international networks and collaborations. Simultaneously, in the field of gender and prison systems, I currently lead the project GEIPP (Gender Equality Policies and Intersectionality in Prison Policies: A Multi-Governed Analysis), thanks to a Marie Sklodowska-Curie (MSCA-COFUND-UNA4CAREER) fellowship at the Complutense University of Madrid. With this project, I bring a fresh approach to studying prison policies in feminist policy analysis, aiming to build a stable researcher network. The goal is to leverage conceptual and analytical tools from diverse disciplines to add new dimensions to the study of gender and the penal system. The project has yielded significant scientific contributions, including publications, edited collections, and the establishment of the international research network Feminist Penality Policy in Action Project (FPPAP), which brings together scholars analyzing prison and detention policies from a gender perspective across different disciplines. I have also participated in various national and international research projects related to incarceration and immigration detention. As an expert in my field, I have collaborated with international and European organizations, as well as national public administrations, contributing my knowledge to different projects. Notable collaborations include the EU program Eurosocial, the Conference of Ministries of Justice of the Iberoamerican Countries (COMJIB) in 2018, and the Catalan Women's Institute in 2020, focusing on gender and the criminal justice system, as well as migrant women and gender-based violence. Over the years, my research on prisons and immigration detention has led to collaborations with various NGOs working in these areas, and I have endeavored to make research results more accessible to society through podcast participation, newspaper interviews, invited talks, and other outreach activities.

**Resumen del Currículum Vitae:**

I am currently the principal investigator of a Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowship (COFUND-UNA4CAREER) at the UCM with the project GEIPP Gender Equality and Intersectionality in prison policies: a multi-governed analysis. I joined the UCM in 2022 after being awarded an Atracción de Talento grant from the Madrid's Community. I am member of 2 international renowned research groups: GEYPO (UCM) and ECRIM (UdC). I have significantly contributed to scholarly discourse, authoring 14 peer-reviewed articles (5 JCR, 3 Q1/Q2 & 6 SCOPUS), with 4 as the solo author (2 JCR Q1 & Q3) and 5 as 1st author (2 JCR Q1 & Q3). I have also published 4 book chapters as solo author. I am currently leading publication projects in my main lines of research: 1) a Special Issue in the international renowned journal Punishment and Society on immigration detention and 2) the edited volume Gender and the Coercive State: Feminist Penality Policy across the Globe. My research has been published in Spanish, Italian, Portuguese and English. I have presented in more than 40 conferences and invited to talk in universities of France, Italy, the UK and Canada.

I have participated in 9 competitive research projects including 5 international projects (funded by the European Commission (MSCA), Social Sciences and Humanities Research Council (SSHRC) of Canada, the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) of Brazil and the British Academy). I have been principal investigator in 2 of them: 1) GEIPP (2023-2025) at the UCM (MSCA-UNA4CAREER-COFUND); and 2) Governmigration, MSCA GF (2018-2021).

My involvement in international projects reflects my dedicated effort to build a noteworthy international academic profile. Other key activities include academic visiting periods to the University of Oxford (2015) and the University of Toronto (2018-2020); coordination of the international thematic network Feminist Penality Policy in Action Project (FPPAP); organization of the International Workshop Changing landscapes of immigration detention (Sept. 2022, University of A Coruña); participation in the international research network Border Criminologies (University of Oxford); and participation in high-level international conferences, among others. My contributions extend to research groups, including as an associate researcher Universidad Nova de Lisboa, and guest lectures by invitation at institutions like the Institute of Criminology, University of Cambridge (UK). Regarding teaching and supervision of researchers, I have accumulated over 300 hours in undergraduate and postgraduate programs across 4 Spanish Universities (UB, UCM, UC3M and UdC) and gave invited lectures in courses at the University of Toronto and University of Cincinnati. I have supervised PhD visiting researchers (1), Master Thesis (4), BA Dissertations (TFGs) (10) and internships (9). Remarkably, since 2020, I have supervised and mentored a group of around 15-20 undergraduate and postgraduate students annually within the teaching innovative project (UCM) "Taller de investigación penitenciaria". I regularly review articles for international renowned journals, served as evaluator of research projects and has been member of several scientific committees, such as in the International Conference "Public criminology and antipunitive debates", A Coruña, May 2023.

**Área Temática:**          Ciencias sociales
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**Título:**                 Dr.

**Resumen de la Memoria:**

I have 12 years of experience in ethnographic research on the intersections of materiality and social relations, unravelling its knowledge and political dimension in four ways: 1. Repair and the materiality of care; 2. Waste and what does not fit in the present or does not disappear properly; 3. What it means to be on the periphery, ontologically and epistemologically; 4. The overgrowing gap between anthropology as a practice and as a discipline, alongside the methodological potential of ethnographic collaborations with artists and designers.

Ethnographically, I have been studying how political discourses have material resonances through fixing interventions. For instance, in contexts such as Estonia, Georgia, and Portugal, I have shown how repairing things, especially those that seem wasted, can be a way of shaping political subjectivities. Concerned with continuity and change, my research has investigated how relations are rematerialized to answer the current multiplicity of crises, including issues of technological change in Germany and Finland. Beyond continuing to work on these domains, I plan to expand my field research on alternative forms of consumption and whether they have the potential to meet current environmental urgencies.

My work has carved a strongly independent and creative path, cultivating originality and innovation in ethnographic methods and material culture studies. An example of this is my curation of several exhibitions. For instance, the show Life in Decline (Estonian Mining Museum, 2021) observed different ways of inhabiting decline in Eastern Estonia, a region characterized by mining and migration. We explored how things endure in a context of negative capability and exhausted ecologies, as well as the adaptive processes of living with the leftovers of modernity.

Also, I have combined material culture with creative research in the project Greetings from Another Land and Another Time (2019), an art installation displayed at the Museum of Contemporary Art of Estonia. Based on archival research, site explorations, and practices of contemporary archaeology, we gathered a series of postcards showing landscapes sacrificed by mining and Soviet modernization in the 20th century. The juxtaposition of different imaginaries of pollution allowed us to understand the ecological memory of the place and how contamination is located in landscapes.

Another example of establishing a bridge between scholars and non-academic actors is Objects of Attention (2020), organised at the Estonian Museum of Applied Art & Design. In this case, I invited ten artists to revise an ordinary object into a political question. This project combined anthropology, art and design to exemplify how objects lend themselves to being used as keys in the interpretation of complex relationships.

Since 2021, I have developed the project Keeping Things in the Dark through 3 exhibitions in Riga (2022), Sillamäe (2023), and Tallinn (2023). For this project, I visited 37 basements on the border between Russia and Estonia to investigate how people use basements to conceal and to regulate the level of intimacy in their homes. My curating practice has allowed me to recognize the expansion of the registers of intervention in social research, which animates crossdisciplinary collaborations and creative modes of ethnographic attention and dissemination.

**Resumen del Currículum Vitae:**

I am an anthropologist dealing with contemporary issues of material culture through ethnographic research. In 2018, I was awarded with the Early Career Prize of the European Association of Social Anthropologists. Currently, I work at Tampere University and convene the Collaboratory for Ethnographic Experimentation (#colleex network, EASA). Stemming from the international cooperation forged through my publications, grants, teaching, curating, and research experience, I have had the chance to regularly share my work in prestigious institutions across Europe, the UK, Russia and the Americas.

In the field of anthropology, I am known for my fresh and insightful contributions, therefore I have been appointed in diverse advisory boards and review committees. Also, I have a demonstrated capability to acquire research funding and experience managing projects in institutions such as Aalto University, University of Helsinki, and Tallinn University. And I have coordinated MA programmes in the Univ. of Leicester and the Estonian Academy of Arts. Likewise, I have been giving postgrad lectures in Humboldt University, Univ. of Lisbon, Andrés Bello Creative Campus of Chile, Vilnius Academy of Arts, Art Academy of Latvia, and the Latvian Academy of Culture.

I am experienced in developing innovative forms for the transfer of knowledge across diverse institutions, working with diverse stakeholders both at level of practice and shared analytical knowledge. My capacity to communicate complex information clearly and to different audiences lends well to the fellowship, along with my intercultural sensitivity, talent in facilitating interdisciplinary collaborations and expertise in Europe's peripheries (speaking half a dozen of languages).

My experience of internationalization and mobility began with a year visiting fellowship at the School of Diplomacy and International Relations in Moscow, and a Masters in Development Cooperation and International Economy in Lisbon, and then it followed working as a correspondent of in Istanbul, Moscow and Berlin for El Mundo, La Clave, Interconomia, and Deutsche Welle. Then, I decided to return to academia and was selected for a visiting fellowship at the University of Helsinki and, later on, another fellowship at Tallinn University, before starting a PhD in this institution while conducting fieldwork in Estonia, Berlin, Lisbon and Tbilisi.

Afterwards, I worked as a postdoc in Finland for over 3 years; later, and for nearly 3 years, I worked as Associate & Visiting Professor in Estonia; and also 1 year of Lectureship in the UK, coordinating the MA program of Museum & Gallery Studies. Overall, I have taught a total of 22 courses in 10 different universities, and I enjoyed fellowships in diverse countries, including Germany, Italy, Portugal, Georgia, Lithuania, the UK and Latvia.

I took part in 13 research projects, being the PI in 7 of them. I managed to secure research funding from institutions such as the ERC Mobilitas, Erasmus Mundus, Erasmus+, Jean Monnet Module, Estonian Ministry of Education, Estonian Environmental Agency, Cajamadrid Trust, Leibniz, CIMO, Nordic Culture Point and the Mellon CHCI Global Humanities Institute, to name a few. Also, I engaged in postgrad supervision: 2 PhD theses (Blanca Jové at the University of Leicester and Mirimari Väyrynen at the Finnish Academy of Fine Arts); and manifold MA theses.

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| **Área Temática:** | Ciencias sociales |
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| **Correo Electrónico:** | francisco.villamil@uc3m.es |
| **Título:** | Postwar politics and the legacies of violence |

**Resumen de la Memoria:**

Postwar politics and the legacies of violence

My research explores the dynamics of political violence, with a focus on what happens in the aftermath of violent conflicts. Using a variety of quantitative methods, I explore the causes and consequences of violence, their effects on patterns of radicalization and polarization, and the effects of policies designed to solve past conflicts and improve social reconciliation.

My main research agenda has explored the legacies of violence against civilians. The main question I try to answer is what are the effects, in the long run, of experiencing political violence during a conflict. This question is of critical importance in order to understand how we can design better peacebuilding strategies. Yet existing research has not been able to explain why and when violence produces such an effect. In my dissertation, and a few published articles (especially a 2021 in Journal of Peace Research), I develop a novel theory arguing that the long-term effects of violence are the product of social activities that take place at the local level in face-to-face interactions. To test the argument, I built new datasets in Spain, Guatemala, and Sub-Saharan Africa and show that the effects of violence are conditional on the local social context. The results have clear implications not only for our theoretical understanding of the legacies of conflicts but for the way we deal with the so-called intractable conflicts. Currently, I am preparing a book manuscript that expands and develops this topic.

In addition to this main research agenda, I have also explored other topics, always related to political violence. Some of these projects focus on the causes of political violence, its short-term consequences, or the role of ideology among armed actors. Many of them have been very fruitful and resulted in top-level publications in Political Science and International Relations.

During the next few years, I plan to develop a new research agenda that looks on the consequences of postwar policies, focusing on Transitional Justice. The main goal is to analyze their effects on political identities and cleavages. This is a crucial factor to understand dynamics of polarization and radicalization, and therefore to assess the risk of renewed political violence. The core hypothesis is that strategies and policies used in post-conflict contexts might reinforce political identities in a way that increases polarization, possibly decreasing support for human rights in general. To answer these questions, I plan to use a variety of empirical methods, including survey experiments, causal evaluation of public policies, and extensive observational data collection and analyses. I have already started to prepare grant applications and although the scope of this project depends on how successful these applications are, I will ideally study a diverse set of countries around the world, such as Guatemala, Chile, South Africa, Sri Lanka, or Indonesia. This project speaks to a larger debate about the global evolution of human rights and the break-up of liberal internationalism. Despite the importance of these dynamics, we know little about why or how human rights norms crumble. This is a topic that is getting increased attention, as an article I published in 2021 in Research & Politics testifies.

**Resumen del Currículum Vitae:**

I started my career at the ETH Zurich and University of Zurich (Switzerland), where I obtained a MA in Comparative and International Studies in 2016. I earned my PhD from ETH Zurich in 2020, with a dissertation that was awarded the Juan Linz Prize to the best dissertation in Political Science. In 2020 I started as a Postdoctoral Researcher at the Universidad Carlos III de Madrid, where I am currently a Visiting Professor. I have also extensive international experience, and have done research stays or carried out field work in the United States, Portugal, and Guatemala.

My research focuses on conflict and political violence. The questions I provide answers to are related with the after-effects of violence and how societies can be rebuilt after war. My work thus helps to design strategies to cope with urgent issues such as postwar reconciliation or the dynamics of polarization and radicalization. To do so, I employ a variety of empirical methods, including survey experiments, causal inference, or spatial statistics. An important part of my work also involves collecting new data from historical archives, for which I have employed computational methods.

First, building on my dissertation, I have published 3 single-authored articles on the long-term consequences of violence (Journal of Peace Research, 2021; European Political Science Review, 2023; and Conflict Management and Peace Science, 2022). Second, I have also worked on the effects of postwar politics, and published an article (Research & Politics, 2021) on the consequences of symbolic memory policies. This topic is also connected to a new research agenda on the consequences of Transitional Justice policies for which I have recently funding as Principal Investigator from the Spanish Ministry of the Presidency to study the consequences of mass-grave exhumations. Finally, I have also worked on many other joint projects, on topics such as the consequences of the Russian invasion of Ukraine on third-party attitudes (The Journal of Politics, 2024), the link between the military and far-right parties (The Journal of Politics, forthcoming), the consequences of violence against civilians on conflict escalation (Journal of Conflict Resolution, 2020), or the dynamics of state purges during and after civil wars (Nationalism and Ethnic Politics, 2020). Two ongoing projects, both in R&R status in Comparative Political Studies, explore the causes of anticlerical violence and the consequences of repression on civic associationism, respectively.

My interest in conflict and violence is also mirrored in my teaching. I have taught for several years two courses that I created and designed: an undergraduate course on political violence and a graduate-level research seminar on International Relations. Both these courses have received very positive evaluations so far. Lastly, I am currently co-supervising one PhD student and have supervised 5 MA theses and around 20 BA theses.

I have also contributed to my home institution as coordinator for the Bachelor Thesis (TFG) of my departament, being responsible for 500+ TFGs each year. I am also actively involved in the international academic community, as a frequent reviewer for international journals, acting as chair or discussant in international conferences, and participating in expert surveys.

**Área Temática:** Ciencias sociales
**Nombre:** VRANCEANU , ALINA
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**Título:** Parties, voters and immigration in current European democracies
**Resumen de la Memoria:**

My research interests lie at the intersection of comparative politics and political behaviour. I study the political consequences of immigration, a contentious facet of globalization, for national politics, political behaviour and mass-elite linkages. Broadly encompassing two inter-related lines of enquiry, my research aims to advance knowledge about public opinion formation and political representation on the cultural dimension of political conflict in current European democracies. It has been published in top political science journals such as the European Journal of Political Research, West European Politics, Government and Opposition, Party Politics, the Journal of Elections, Public Opinion, and Parties,

The first line centers on the main sources of voters' preferences for immigration policy, exploring inter alia how political parties can shape mass preferences on this issue. Drawing largely on a comparative approach and a variety of quantitative methods, my published work is at the forefront of research showing that voters' preferences for cross-country cooperation on migration balance national interest, humanitarian and reciprocity considerations (Vrânceanu et al., 2023) and that citizens take cues from national governments when forming preferences for EU asylum policies (Kriesi & Vrânceanu, 2023). It also sheds new light on how educational and partisan cross-pressures render individual views about immigration more moderate (Vrânceanu, 2022) and how attitudes to immigrant outgroups are influenced by cues from political elites and policy regimes (Vrânceanu & Lachat, 2021). Additional working papers enrich the current understanding of the institutional, regime and policy determinants of anti-immigrant sentiment and of social conservativism. The second examines some of the most important factors affecting political parties' responsiveness to public opinion on the issue. In an article published in Party Politics (2019), I show that mainstream parties are more responsive when they face competition from strong radical right parties.

Throughout the grant duration, I aim to examine how immigration and outgroup attitudes shape individual beliefs about democracy. In tackling this broader question, I will seek to address the following inter-related research questions.
(1) Does hostility to immigration impact individuals' commitment to democratic norms?
(2) Does ethnic diversity impact natives' attitudes to democracy, and if so, how?
(3) What role do political parties play in weakening or strengthening the relation between the two sets of political attitudes, namely attitudes to immigration and democracy?
(4) Do historical regime legacies further affect these dynamics?

To answer these questions, I plan on conducting observational and experimental studies, relying for the former on existing secondary on public opinion data from sources such as the European Social Survey, the World Values Survey and others.

In a context of increasing risks of democratic backsliding in several European countries and growing ethnic diversity across Europe, research on these questions will advance knowledge on how exposure to immigration fosters distinct beliefs about democracy, and it will contribute to richer theoretical and empirical understanding of current societal challenges and opportunities.

For further details, see the attached 'Memoria' document.

**Resumen del Currículum Vitae:**

(For the full CV summary, see CV attached to the application)

I am a political scientist, currently holding a María Zambrano Postdoctoral Fellowship at Universitat Pompeu Fabra, Department of Political and Social Sciences. Previously, I held a Research Fellow position (2020-2022) and a Max Weber Postdoctoral Fellow position (2018 2020) at the European University Institute (Florence, Italy). I received my PhD in Political and Social Sciences from Universitat Pompeu Fabra in November 2018. My work has been published in top political science journals like the European Journal of Political Research, West European Politics, Government and Opposition, Party Politics, the Journal of Elections, Public Opinion, and Parties, and in book chapters published at Springer and Edward Elgar.

My research interests lie at the intersection of comparative politics and political behaviour. I am particularly interested in how immigration, a contentious facet of globalization, affects citizens, political parties and mass-elite linkages in current European democracies. One line of my research examines the sources of voters' preferences for immigration policy. A second line examines political parties' responsiveness to public opinion about immigration.

I have a strong international profile in terms of scientific collaborations and academic mobility, having obtained the prestigious and highly competitive Max Weber Postdoctoral Fellowship at the European University Institute (2018-2020), followed by a position as Research Fellow in the international project 'Mercator Dialogue on Asylum and Migration' (MEDAM) at the EUI between 2020-2022. In spring 2017 I did a short research stay at the University of Essex sponsored by Lawrence Ezrow. I have collaborated and published with internationally renowned academics like Hanspeter Kriesi, Elias Dinas, Martin Ruhs and James Dennison. I attracted grants from competitive sources such as the Max Weber Fellowship (EUI, 2018-2020), a Maria Zambrano grant to attract international talent (UPF, 2022-2024) and a FI pre-doctoral grant (UPF, 2015-2018).

Between 2015 and 2023, I delivered close to twenty paper presentations at major international conferences, including APSA, EPSA, ECPR, MPSA, and 9 invited talks at European and North American universities, including the European University Institute, Humboldt University of Berlin and the University of Montreal. I have also acted as invited chair and discussant in numerous conference panels on topics like public opinion, political responsiveness, populism, nationalism, identity, race and immigration. Other dissemination activities include participation in roundtables with stakeholders organised by think tanks such as ELIAMEP (Greece) and the European Policy Centre (Belgium).

I have acted as journal reviewer for numerous international political science journals, like the British Journal of Political Science, the European Journal of Political Research, the Journal of European Public Policy, Government and Opposition and others, and as an external reviewer for the Swiss National Science Foundation. Finally, I attained both solid teaching experience (UPF) and formal teaching training (EUI), in addition to the extensive non-academic work experience gathered between October 2008 and September 2013 at the European Commission.

**Área Temática:** Ciencias sociales
**Nombre:** OPHIR , ARIANE
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**Correo Electrónico:** aophir@ced.uab.es
**Título:** Family dynamics and gender inequality

**Resumen de la Memoria:**

I am a sociologist and demographer whose scholarship centers on questions related to the interplay of population dynamics and gender inequality within and across families. I have several independent and collaborative research lines focusing on Europe, the United States, and the United Kingdom. My work utilizes highly complex datasets and demonstrates novel applications of demographic techniques, which were recognized by publications in top-ranking sociological and demographic journals.

As a Juan de la Cierva Postdoctoral Fellow in the Centre d' Estudis Demogràfics (CED-CERCA) in Barcelona, I am collaborating with Dr. Diederik Boertien to study sexual minorities' family formation dynamics. We challenge prominent family demography theories by focusing on sexual minorities' family formation outcomes. We investigate sexual minorities' family formation trajectories, how these have changed over time, and gender differences in second union formation outcomes. This collaboration, on which I am the leading author, underscores the importance of social and historical context for understanding diverging demographic outcomes among sexual minorities. Our work was published in Demography and was conditionally accepted in Social Forces, two leading demographic and sociological journals.

In a second line of research, I introduce a novel demographic approach to studying the caregiving burden in aging populations, focusing on Europe. The innovation of this research is the application of the Life Expectancy metric to measure the cumulative exposure to caregiving responsibilities in adulthood, i.e., how many years European adults are expected to be unpaid family caregivers. This work has important implications for policies targeting women's retirement age and our (counterintuitive) understanding of how population aging shapes the unpaid caregiving burden and its components. My work in this domain won the Best Student Paper Award from the Sociology of Population Section at the American Sociological Association (2020), was published in a top-ranking aging interdisciplinary journal, and was covered by a Population Reference Bureau (PRB) report (a nonpartisan organization that translates research for policy recommendations).

In a third research, I investigate gender inequality in housework in the United States. I draw on life course and family structure frameworks to understand the circumstances under which gender scripts and norms related to housework are challenged or reproduced. I also focus on the role of living arrangements and household composition in shaping gender inequality. My research demonstrates that although housework is dynamic over the life course, the gender dynamics that shape housework are stable amid union instability, and that gender dynamics organize housework even in households that do not compose "nuclear" family units.

My future research agenda includes (i) a focus on the intergenerational and longitudinal aspects of unequal and gendered household division of labor from a cross-national perspective and (ii) a focus on singlehood. I aim to establish a social-demography framework to inform demographers, sociologists, and policy decision-makers by bridging population and stratification approaches to studying singlehood in Europe. I have submitted an ERC Starting Grant proposal to fund this project.

**Resumen del Currículum Vitae:**

I received my PhD in sociology (with training in demography) from the University of Wisconsin-Madison (2021) and currently am a Juan de la Cierva Postdoctoral Fellow in the Centre d'Estudis Demogràfics (CED-CERCA) in Barcelona.

My career is distinguished by international collaborations with leading family scholars. As a doctoral student, I have collaborated on research with Prof. Marcy Carlson (University of Wisconsin-Madison) and Prof. Paula Fomby (then at the University of Michigan, now at the University of Pennsylvania) on their NICHD-funded project "Family Complexity, Resources, and the Transition to Adulthood." In CED, I am collaborating with Dr. Diederik Boertien on his ERC-funded project "Sexual Minorities and Inequality of Opportunity." These ongoing collaborations produced several publications in top-ranking and internationally leading journals (Demography, Journal of Marriage and Family, and Social Forces). Moreover, both collaborations have introduced me to American and European networks and contributed to my life course and demography analytical skills.

My scholarship was also recognized for its excellence and impact. As a doctoral student, I won the Best Student Paper Award from the Sociology of Population Section at the American Sociological Association (2020). As a postdoc, I have won the Juan de la Cierva fellowship. Additionally, As of January 2024, I am an Editorial Board member at the Journal of Marriage and Family (JMF), the leading journal in family scholarship. In addition, my articles have been included in master- and doctorate-level syllabi in the USA and Europe.

I regularly participate in international conferences, such as the Population Association of America (PAA), the Work and Family Researchers Network (WFRN), the International Sociological Association Research Committee 28 on Social Stratification and Mobility (RC28), and the European Sociological Association, The European Population Conference (EPC). Moreover, I take an active role in these networks. For example, I served as a discussant in several PAA sessions over the past three years and organized the "Union Formation" oral session at the 2023 annual meeting. I also won the Early Career Fellowship at WFRN, which targets young, promising family scholars and offers professional development and integration into this international network.

In my short academic career, I have continuously demonstrated my independence and leadership skills through research activities and participation in scholarly communities, mentoring, and leading organizational initiatives. In CED, I mentored, supervised, and participated in evaluating students' progress in CED and through the European Doctoral School of Demography (EDSD) program. As a postdoc, I initiated, organized, developed, and led a monthly professional development seminar for students and early-career researchers. This seminar series offered an open structured curriculum that cultivated "soft" academic skills necessary for thriving in academia but also cultivating an equitable, transparent, and inclusive research community. The topics covered included, for example, choosing a research agenda, making the most of conference attendance, using social media for networking, navigating the peer-review process, using citation managers, and career options after the PhD.

**Área Temática:** Ciencias sociales
**Nombre:** SCHWEITZER , REINHARD
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**Título:** Policies, Politics & Practices of Migration and Migration Control

**Resumen de la Memoria:**

I have more than ten years of experience conducting theoretically grounded empirical research in the interdisciplinary fields of migration, integration, and refugee studies. My mostly comparative research focusses on the interplay between migration and migration governance, including public but also private and civil society efforts to control, direct, and select different kinds of mobility, and to manage the resulting diversities, inequalities, and conflicts. I combine different disciplinary perspectives (political science, sociology, geography, anthropology, organisation studies) and employ mostly qualitative methods (especially in-depth interviews, discourse and policy analysis). Through my research and writing I have contributed to timely academic debates and provided insights for policymaking on key societal challenges, including the intersection of migration control with public welfare provision. My PhD research on irregular migrants' access to healthcare, education, and social assistance in London and Barcelona led to important insights into how and why different "street-level-bureaucrats" (like doctors, teachers, and social workers) get involved in immigration control and enforcement. I developed a novel theoretical approach and analytical framework for systematic comparison of such involvements across different countries and sectors of service provision. My research has also contributed to a better understanding of the close relationship between the integration of migrants into a society and the integration (or cohesion) of that same society. For example, I traced how exclusionary rules for irregular migrants negatively affect public welfare provision overall, with significant implications for the whole population. In my Marie-Curie project REvolTURN (2018-2020) I have compared so-called "voluntary return" policies for (rejected) asylum seekers in Austria and the UK and showed how the increasing exclusion of NGOs from the implementation of these policies undermines the very principle of voluntariness and thereby renders these returns practically indistinguishable from deportation. Through this project I also triggered a broader debate about voluntariness as a crucial element of migration governance. The latest research I conducted was within a large Horizon project (WholeCOMM) that systematically compared local integration processes, policies, and outcomes across 49 small and medium-sized towns and rural areas in eight EU and two non-EU countries.

In the coming five years I will develop two new lines of research: On one hand, I will investigate the use – by more and more EU member states – of citizenship as a form of restitution. From a critical and comparative perspective and focussing on recent citizenship reforms in Austria and Spain, this project will analyse how the two reforms came about (and why now); how the new rules are being implemented across various countries; and what motivates applicants from different parts of the world to use the resulting opportunities. A second theme that I plan to investigate is the effect that official narratives and popular framings of migration have on the interactions and everyday encounters that migrants have with other citizens as well as public and private institutions.

**Resumen del Currículum Vitae:**

I am a political sociologist with a PhD in Migration Studies (from the University of Sussex, 2018) as well as degrees in Political Science and Sociology (from the University of Innsbruck, 2010), all with distinction. Since January 2024 I am a Research Professor at Universitat Abat Oliba CEU in Barcelona. From September 2021 to July 2023, I was a postdoctoral Research Fellow in the Area of Migrations of the Barcelona Centre for International Affairs (CIDOB) where I was the main researcher within the international research project WholeCOMM (Horizon 2020). Before that, from October 2018 to September 2020, I was a Marie Skłodowska-Curie Individual Fellow at the department of Political Science of the University of Vienna (Austria), where I led the research project "REvolTURN – Managing migrant return through 'voluntariness'" (Horizon 2020-MSCA). Before that I worked as a Research Fellow in the project CEASEVAL (Horizon 2020) based at the University of Sussex, where I had previously conducted my PhD research as a Marie Skłodowska-Curie Early-Stage Research Fellow with the INTEGRIM network. I have taught BA, MA, and PhD students (in English and German) on political systems and institutions, policies and practices of migration/control, and key aspects of social science research methods. I am fluent in German, English, and Spanish, can communicate in Italian, and am currently learning Catalan. I spent extensive research periods in Santiago de Chile, London, Barcelona, and Vienna, and have volunteered for migrant support organisations in London, Vienna, and Barcelona. The results of my research have been published in high-ranking (Q1) academic journals, several peer-reviewed books including my prize-winning open-access book Micro-Management of Irregular Migration (Springer, 2022), as well as national and comparative project reports, policy briefs, and blogposts. Over the last years I presented and discussed my findings at more than 30 international conferences, workshops, as well as non-academic events for knowledge exchange with policymakers and civil society at the EU, national, and local levels. Since 2021 I am Associate Editor of the world-leading Journal of Ethnic and Migration Studies; and since 2022, I co-direct the INTEGRIM-Lab, a Brussels-based non-profit organisation providing research services to different stakeholders working on migration and for social justice.

**Área Temática:** Ciencias sociales
**Nombre:** BARÓ , FRANCESC
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**Título:** Integrating Urban Ecosystem Services in Environmental Planning

**Resumen de la Memoria:**

My academic work has been fundamental to applied environmental science by: conceptualizing and assessing urban ecosystem services, expanding the field of urban ecology towards environmental justice dimensions, and evaluating and operationalizing the concepts of green infrastructure and nature-based solutions (NBS) in the context of regional and urban environmental planning. The highlights of my research career are the following: 1) track record of 60+ scientific publications, mostly in Q1 journals in the field of Environmental Science; 2) All my research articles as first or corresponding are available in open access (OA), mostly Gold OA; 3) I am strongly committed to outreach activities and to enhance the societal impact of my research. I have served as advisor/expert in environmental planning for several public institutions and my current research on the benefits of NBS in school environments is also reaching end-users; 4) I have been awarded several individual competitive grants and academic honors during my career, including a Special Prize for Doctoral Studies (UAB) for my thesis on the assessment of urban ecosystem services, and a prestigious Marie Cure Individual Fellowship; 5) My research career has developed across different countries, primarily Spain and Belgium. Since January 2021, I am appointed as Asst. Research Professor at the VUB, Belgium, where I am leading a research line on urban social-ecological systems; 6) I have built an extensive international network of collaborators (>280), via multiple co-authorships, scientific editorial work, participation and organization of international conferences, including collaborations with top scientist in my field such as Prof. D. Haase or Prof. J.C. Svenning; 7) I have participated in more than 20 collaborative research consortia funded via competitive calls, such as Horizon 2020 or BiodivERsA. I have raised and managed a total budget of more than 1.5M€ as PI or co-PI; 8) I am highly devoted to training and mentoring of early-career researchers. To date, I have mentored 4 postdocs, (co-)supervised 6 PhD candidates and hosted 4 visiting PhD researchers in my team; 9) I am responsible for organizing and giving three MSc level courses at VUB since 2021-2022, including a 6 ETCS course on "Greening the City".

The main goal of my research line during the RyC fellowship will be to assess the role of NBS for urban climate resilience, especially in the context of extreme events (e.g., heatwaves, extreme precipitation, droughts). More specifically, the research objectives are: 1) to identify and map the level of hybridization between NBS and built infrastructure, especially social infrastructure, considering its implications for urban climate justice; 2) to explore how this new (nature-based) climate resilient infrastructure is perceived and used by urban residents, especially those most vulnerable to climate change, during extreme events; 3) to understand which are the main social (S), ecological (E) and technological (T) components involved in the success (or failure) of urban nature-based climate shelters, using the SETS framework. In terms of funding, my priority will be to build a strong research proposal to apply to the ERC Consolidator call during the fellowship period. I will also consider other funding options (e.g., Spanish State Plan for Scientific Research calls).

**Resumen del Currículum Vitae:**

I have widely disseminated my research work in the field of applied environmental science, by publishing 50+ articles in JCR-indexed international (mostly Q1) journals and 13 book chapters with remarkable scientific impact (5600+ citations and h-index 33 in Google Scholar), and by contributing to 70+ scientific events, including co-organizing 7 sessions in international congresses and giving multiple oral presentations and invited talks. I have been awarded several individual competitive grants and academic honors, including an international Marie Curie Individual Fellowship (EC, 2021), a Special Award for Doctoral Studies (UAB, 2020), and best article award in the Science category (Social Observatory of "la Caixa", 2018, 10k€ prize). I received and managed highly competitive international research grants as (co-)PI, including JPI Urban Europe: COOLSCHOOLS (2022-2025; 228k€), EU-Horizon-2020: CLEARING HOUSE (2019-2024; 482k€), BiodivERsA: ENABLE (2017-2019; 134k€). In total, I have raised and managed a budget of more than 1.5M€ Thanks to my participation in international research consortia and scientific societies (e.g., Ecosystem Service Partnership) I have built an extensive international network of collaborators, also reflected by papers' co-authorships with 286 researchers from 144 institutions/affiliations and 43 countries. I have served as advisor/expert for public institutions at the municipal, regional, and national levels. I also collaborate with international and national outreach & policy organizations such as UN-HABITAT, IUCN, ICLEI, and CONAMA Foundation. According to the web-based tool Sage Policy Profiles, my research has generated 175 citations across 131 policy documents, mostly in Europe (110 citations), but also in the US (8), Australia (2) and from intergovernmental organizations (55). My outreach and societal engagement activities include social media and blog posts, policy briefs, press releases, knowledge brokering and facilitation of workshops with stakeholders. To date, I have mentored four postdocs (3 ongoing) and (co-)supervised 6 PhD candidates (5 ongoing; 1 completed). Furthermore, I have (co-) supervised 20+ Master and Bachelor thesis from different international programs. Regarding teaching, I am responsible for organizing and giving 3 MSc level courses at VUB (12 ECTS in total) with an average attendance of 40-50 students per course. I also frequently give guest lectures in several MSc and undergraduate programs (4-5 per year) across Europe, mostly in Belgium and Spain. Currently, I lead a research lab on urban social-ecological systems within the Cosmopolis Center for Urban Research (VUB) and I am affiliated to 3 other research groups as senior researcher. I have taken on several editor roles at international journals: as Academic Editor of PLOS Climate, as Associate Editor of Frontiers in Environmental Science (section Social-Ecological Urban Systems), and as guest editor of Science of the Total Environment and Environmental Science and Policy. I am frequently invited reviewer for various JCR journals, book chapters, and project proposals, including one appointment as ERC remote referee for the prestigious ERC Consolidator Grant 2021 Call. I have also served as jury member or international reviewer in 11 PhD thesis and 15+ master thesis defenses from different programs across Europe.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | DEL ROSAL  RABES, BLANCA |
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| **Correo Electrónico:** | blanca.delrosalr@gmail.com |
| **Título:** | Near-infrared nanothermometry for all-optical contactless neuromodulation and sensing |

**Resumen de la Memoria:**

Research context: My research focuses on developing light-based tools for disease diagnosis and minimally invasive therapy. Light-activated nanoparticles are central to my research, acting both as sensors of changes indicative of disease development (such as temperature changes) and as transducers of light into secondary stimuli (such as heat) to trigger physiological changes. As a Ramon y Cajal Fellowship, my proposed research line will apply my background in NIR-II thermometry - acquired during my PhD at UAM - to the understanding of photothermal neuromodulation, an emerging technique for selective activation or inhibition of neural activity which I am currently researching at RMIT as a way of addressing lost vision due to nerve damage.

Background to the proposed research line: Electrical stimulation is an established technique in neuroscience research, while also having clinical applications treatment of a range of neuromuscular and neurodegenerative disorders, from Parkinson's disease to neuropathic pain. Conventional stimulation techniques rely on direct implantation of electrodes, which cause tissue damage due to the mismatch in physical properties between electrodes and neural tissue. This has led to the development of alternative techniques for neural stimulation, from polymer-based soft electrodes to electrode-free contactless approaches involving localised heating triggered by light or magnetic fields.
However, the effect of a given heating stimulus on neuronal activity is virtually impossible to predict a priori, since various physiological parameters involved in electrical signalling –membrane capacitance, permeability of different ion channels – are affected by temperature. There is a complex interplay between these parameters, so small variations in the magnitude or gradient of the temperature change can cause drastically different effects in neuronal activity. Therefore, monitoring electrical activity during thermal stimulation is essential to make sure the target effect is achieved. However, there are no contactless techniques capable of measuring neuronal activity in vivo during thermal stimulation.

Objectives: My research aims to address this gap by exploiting the direct connection between local temperature and neuronal activity through the following objectives:
(1)	Develop an in vitro approach for sensing temperature and electrical activity of neurons simultaneously. This will require assessing existing photoluminescent voltage probes and temperature-sensitive nanoparticles to (i) determine the feasibility of using existing molecular voltage sensors to measure electrical activity of neurons undergoing photothermal stimulation, and (ii) assess the potential of cross-talk between temperature and electrical activity measurements.
(2)	Systematically study the effect of photothermal heating on neuronal activity in vitro, separately assessing the effects of (i) the magnitude of the temperature change, and (ii) the temperature gradient. This will generate a full understanding of the link between temperature and neuronal activity, essential to further develop a thermometry-based approach to monitor thermal neuromodulation in vivo.
(3)	Assess the validity of local temperature to monitor the effect of photothermal neuromodulation of peripheral nerves in a healthy mouse model.

**Resumen del Currículum Vitae:**

Career trajectory: I am a mid-career researcher (7 years post-PhD) and I currently hold a research-focused Senior Research Fellow position within the Physics department at RMIT University in Melbourne, Australia. I obtained my PhD in 2017 from Universidad Autónoma de Madrid (UAM), where I studied the application of nanomaterials operating in the near-infrared for diagnostic and therapeutic applications in animal models under the supervision of Prof Daniel Jaque. I have held independent research positions since 2017, first at the Centre for Micro-Photonics at Swinburne University of Technology and then at RMIT, which I joined in March 2020 as a Vice-Chancellor's Fellow. I was promoted to Senior Research Fellow in 2024.

Research output: My work has resulted in 59 publications: 55 journal articles – 50 of those in Q1 journals – and four book chapters, attracting more than 5,000 citations with an h-index of 34 (Web of Science, January 2024). I have a field-weighted citation impact of 3.34 (SciVal, January 2024), indicating that my publications have been cited 234% above the worldwide average for publications in the same field, journal type and year. In 2019, I was identified as one of the five leading early career researchers in Materials Science worldwide by Nature Index, highlighting the impact of my published research. I am also co-inventor in a patented technology to identify unstable atherosclerotic plaques by taking advantage of their intrinsic fluorescence, currently licensed to medical device company Nirtek.

Research funding: I have received more than $1.5M AUD (approx. 1M €) as Chief Investigator (CI) in competitive research funding from the Australian Research Council (ARC), the Australian Academy of Sciences and others. My funded projects include an ARC DECRA Fellowship (success rate approx. 16%) focused on near-infrared nanothermometry for neuroscience applications, an ARC Discovery Project (success rate approx. 11%) to investigate retinal autofluorescence as a brain disease indicator, and an ARC LIEF grant (success rate approx. 33%) coordinated by Prof Arnan Mitchell. ARC LIEFs are multi-institutional coordinated projects supporting equipment and infrastructure development – in this case, a hyperspectral microscopy facility based on optical frequency combs.

Student supervision: I have supervised two PhD students to completion, as well as two Honours students and four and undergraduate 'Science Project' student. I am currently supervising four PhD students.

Teaching: Despite holding a research-focused role, I have contributed to undergraduate teaching in Physics at RMIT since 2020 as a lecturer (Mechanics, 2021) and tutor (Optics & Photonics, Modern Physics, 2020-2022). I have also coordinated large core Science degree courses (The Professional Scientist, >150 students, 2021-2022). In 2023, I became the course coordinator and lecturer (36 contact hours) of a new core Physics (Introduction to Electromagnetism), also developing the curriculum for this new course.

Scholarly engagement: I am a grant assessor for the Australian Research Council and I have examined PhD theses within Australia. I regularly peer-review articles for journals in Materials Sciences. In 2022, Nanoscale (Q1 in Materials Sciences) named one of me as one of their outstanding peer reviewers.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | CAMARERO ESPINOSA, SANDRA |
| **Referencia:** | RYC2023-044860-I |
| **Correo Electrónico:** | sandra.camarero@polymat.eu |
| **Título:** | BioSmarTE - Smart materials for tissue engineering |

**Resumen de la Memoria:**

My unique research line revolves around the regeneration of complex tissues, through the design and exploitation of functional smart scaffolds. The design of hierarchical biomaterials whose properties can be tuned mimicking nature and, the effect of these ones on cell fate and matrix deposition are the focus of my research. Lately, the use of materials that can be actuated remotely and allow to control the applied stimuli to surrounding cells is also central to my work. Thus, my research is highly interdisciplinary.

With the constant ageing of the society our quality of life depends increasingly in our capability to regenerate damaged or pathological tissues and organs. At BioSmarTE we focus on the regeneration of complex tissues and the development of cellular models of disease with the aid of smart materials and biofabrication technologies. The first 30 years of research since the definition of tissue engineering on the early 90s, have taken us to the realization that despite being able to grow tissues in-vitro, these lack of functionality and therefore, after implantation into the body fail at long term. This is due to the high complexity of tissues that arrange into hierarchical structures providing the organ with its main functions. Thus, research so far has mainly been focused on a "form follows function" approach in which we try to mimic as much as possible the native physicochemical environment (topography, bioactivity) of the cells, hoping that in turn, thiese synthesize a coherently organized and functional matrix or tissue. However, these organs are constantly subjected to stimuli (both physical and chemical) that regulate the homeostasis.
&#61656;       At BioSmarTE my objective is to tackle tissue regeneration under a "function follows form" approach. This approach is based on the stimulation of cells with the same biophysical stimuli they perceive on their native environments, acting as "gym" were cells can deposit coherent tissues. Our main strategy to target this goal is through the combination of advanced smart materials and biofabrication techniques such as 3D printing (in all its modalities). Key aspects of our research relay on the development of smart stimuli-responsive materials that can be actuated remotely and "on-command" using triggers such sonic, magnetic and electric stimulation.

**Resumen del Currículum Vitae:**

I developed my career internationally. I conducted my PhD in Switzerland, where I investigated on materials sciences and scaffolds for tissue regeneration; my first postdoc was at the University of Queensland (Australia), where I learnt about stem cells and signaling pathways and, spent later 3 years at Maastricht University (The Netherlands) where I strengthen my knowledge in biofabrication, particularly in 3D printing. Now, I am a junior PI at POLYMAT where I just stablished the BioSmarTE group (2020). Currently, I supervise 6 PhD students (3 in co-supervision) and I have supervised 1 postdoctoral researcher and 4 M.Sc thesis in POLYMAT. In parallel, I co-supervise 2 PhD students from Maastricht University and a third one that graduted this last 2023.

I have published over 39 scientific articles, 2 editorials and 1 book chapter. I am first author of 14 of these, corresponding author of 4 of them and second last author of another 8 (resulting from co-supervised PhD students). My average impact factor (IF) is 11, with 17 D1 articles and 29 Q1. I account for over 3400 citations, an h-index of 21 and an i10-index of 25 (Google Scholar). I have also contributed actively to the dissemination of my work with 25 oral presentations, being 14 of them invited talks and 1 poster presentation.

I have secured funding for more than 1 million €as PI of the project (or PI partner). These include international grants such as a H2020-MSCA-IF, MSCA-DN and a H2020-RIA, national grants such as a RETOS i+D from the MICINN and regional grants from the Provincial Council of Guipuzcoa and from the Basque Government.

Recently I have obtained the R3 certification with an evaluation of 100/100. I have also been recognized by my peers with invited article contributions (Carbohydrate Polymers 2021) and other ongoing invitaions as "rising star" collections of Advanced Healthcare Materials and "emergent investigator" of the Journal of Materials Chemistry B.

I have received sevarl awards during my career, including an award to an outstanding thesis from the Swiss Chemical Society (2015) a Future Faculty Scholar recognition from the American Chemical Society¿s PMSE division (2018) and lately I am an elected member of the Young Academy Europe (2022).

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | QUINSON , JONATHAN |
| **Referencia:** | RYC2023-042920-I |
| **Correo Electrónico:** | jonathanquinson@msn.com |
| **Título:** | Fundamental and applied research on nanomaterials for catalysis and energy conversion |

**Resumen de la Memoria:**

OVERVIEW
Over the last 13 years, I, Jonathan Quinson, developed scientific skills and a wide network in 9 research groups (9 different PIs), in 6 institutions, in 4 countries (FR, UK, DK, USA). I have expertise in synthesis (e.g. surfactant-free colloidal precious metal nanoparticles), characterization (e.g. electron microscopy, X-rays, synchrotrons) and properties assessment (e.g. electrocatalysis) of nanomaterials. I showed that my ideas and skills can lead to high impact fundamental and applied research. I am therefore well equipped to lead a multi- and inter- disciplinary research team to develop a paradigm shift in nanomaterial / nanocatalyst design and synthesis.

MOBILITY & SELECTED ACHIEVEMENTS
I hold an MSc (Distinction) from ESPCI, FR, and an MRes (Distinction) from Imperial College London, UK. I did my PhD at Uni. Oxford, UK, as a full time member of two groups in two departments: Prof N. Grobert for nanomaterial synthesis and characterization and Prof K. A. Vincent for bio-spectro-electrochemistry. I then joined Uni. Copenhagen, DK, in the group of Prof Arenz (now Bern, CH) where I developed nanoparticle synthesis. I significantly simplified a synthesis method, leading to a patent, a startup, and catalysts up to x10 more active than the state-of-the-art (Angew. Chem. Int. Ed., 2018). I secured a Marie Curie Individual Fellowship and worked with Assist Prof M. Escudero-Escribano (now ICN2, ES) on electrode design. I also significantly contributed then on a large collaborative work published in Nat. Mater. (2021, 3rd author / 21). I then desired to develop more experience on characterization and approached and convinced Assit Prof K. M. Ø. Jensen that the technology I developed was relevant for fundamental studies, with the success of a publication in JACS (2023). I then secured a Marie Curie Global Fellowship to initially perform 2 years research at Uni. Stanford, USA, with Assist Prof M. Cargnello. Due to Covid pandemic I stayed at the Center for High Entropy Alloy Catalysis led by Prof J. Rossmeisl at Uni. Copenhagen, with the success of a second patent application, reported in Chem. Mater. 2023. I ultimately spent 6 months at Uni. Stanford before starting a Tenure Track Assist Prof position at Aarhus Uni., with the success of 3 papers submitted in 2023.

INDEPENDENCE & LEADERSHIP
I authored 71 publications (incl. reviews), 1 book chapter and 2 patents. I am first author on 34, corresponding on 34 (incl. JACS, Angew. Chem., Adv. Colloid Interface Sci (x2), ACS Catal. (x2), Chem. Mater.), sole corresponding on 11, and last author on 10 publications. I hope this shows my potential as PI, the trust from my collaborators in my skills to design, lead, perform and complete high quality research.
As PI, I secured 1+ Meuros for my research (including a PhD project). I also secured 5+ beamtimes at PI. I (co)supervise(d) overall 6 BSc, 9 MSc, 11 PhD, 1 postdoc.

OTHER SELECTED CONTRIBUTIONS
I co-secured startup funding (722 keuros, 2018, DE).
My research results were used by my previous mentor to secure a H2020-NMBP-ST-IND-2019 (EU) funding: Recycalyze (5.6 Meuros).
My expertise was used to co-secure a EIC (EU) Pathfinder Challenge 2023 grant: ReZilient (864 keuros out of 4 Meuros), where I am co-PI on a work package.
I designed teaching material based on my research: MSc level, publication in J. Chem. Edu. 2023.

**Resumen del Currículum Vitae:**

EXPERTISE-INTERESTS
>Nanomaterials
 -synthesis: surfactant-free colloids, precious metals
 -characterization: electron microscopy, X-rays, synchrotrons
>(Electro)Catalysis: Energy conversion
>Green chemistry / Sustainability
>Innovation

POSITION
2022-now   Tenure Track Assist Professor, Aarhus Uni., DK
         Group leader: NEST - Nanomaterials Engineering for Sustainable Technologies

PREVIOUS POSITIONS
2020-2022  Marie Curie Global Fellow - CATALYSIS
         Center for High Entropy Alloys Catalysis (CHEAC), Uni. Copenhagen, DK - Prof J.Rossmeisl
         + Uni. Stanford, USA - Assist Prof M.Cargnello
2019-2020  Assist Prof - STRUCTURAL CHARACTERIZATION
         Uni. Copenhagen, DK - Assist Prof K.M.Ø.Jensen
2017-2019  Marie Curie Individual Fellow - ELECTROCATALYSIS
         Uni. Copenhagen, DK - Assist Prof M.Escudero-Escribano

2015-2017  Postdoc - ENERGY
        Uni. Copenhagen, DK - Assoc Prof M.Arenz


EDUCATION
2011-2015  PhD - NAMOMATERIALS+BIO-SPECTRO-ELECTRO-CHEMISTRY
        Uni. Oxford, UK - Profs N.Grobert+K.A.Vincent
2010-2011  MRes - GREEN CHEMISTRY - DISTINCTION
        Imperial College London, UK - Profs A.Kucernak+G.Britovsek
2007-2010  MSc - NATURAL SCIENCES - DISTINCTION
        ESPCI, Paris, FR - Top French Engineering school
        Profs F.Kanoufi+C.Combellas
2005-2007  BSc (eq.) - NATURAL SCIENCES
        Lycee du Parc, Lyon, FR - Top French ''Prepa''
2005        French Scientific Baccalaureate - DISTINCTION


SELECTED AWARDS / FUNDING
>PhD project fund, PI (2023, 425 keuros, DK)
>Welcome fund, Uni. Aarhus, PI (2022, 40 keuros, DK)
>Marie Curie Global Fellowship, PI (2020, 269 keuros, EU)
>Marie Curie Individual Fellowship, PI (2017, 200 keuros, EU)
>Startup seed fund, co-applicant (CTO) (2018, 722 keuros, DE)
>Startup Idea competition: PI, 2nd in Green and 2nd in Social Media categories (2018, DK)
>co-PI in work package, EIC Pathfinder Challenge ReZilient (864 keuros for Uni. Aarhus / 4 Meuros, 2023, EU)


PUBLICATIONS - PATENTS
-71 peer-reviewed publications
 >34 as 1st author
 >34 as corresponding author
 >11 as sole corresponding
 >10 as last author
 >h-index: 25; Citations: 1740+ (600+ in 2023, Google scholar)
-Examples of journals:
Nat. Mater., JACS, Angew. Chem. Int. Ed.,
Adv. Colloid Interface Sci. (x2), ACS Catal. (x9),
JACS Au (x2), J. Mat. Chem. A (x2), Chem. Mater.
-1 book chapter
-8 Faraday Discussions articles
-2 patents / patents applications


INTERNATIONALIZATION
-Worked in  9 research groups, 6 institutions, 4 countries: FR, UK, DK, USA (see above).
-Wide network (incl. current and former collaborators) in: FR, UK, DK, USA, CH, DE, ES, BE, SE, NL, JP, SG


INDEPENDENCE & LEADERSHIP
-Tenure Track Assist Professor (own group) since 2022
-Manage(d) 1+ Meuros as PI
-PI on 5+ beamtimes at synchrotrons
-Panel member for ESRF beamtime allocations


SUPERVISION
-2024: 3 BSc, 2 MSc, 1 PhD, 1 Postdoc
-2022-2023: 1 BSc, 1 MSc
-'co'-supervision: 3 BSc, 6 MSc, 10 PhD


TEACHING
-2023: Course responsible, MSc, 10 ECTS
-2022: MSc, 3.5 ECTS eq. + BSc, 3.5 ECTS eq.
-2015-2021: teaching assistant+guest lecturer, MSc, 3.5 ECTS eq.


DISSEMINATION
-Use Open Access

-20+ talks: e.g. ACS / MRS meetings
-Organized a science-picture competition+exhibition
-Demonstrate at science fairs
-Co-created a startup

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | SCHNELL , MARTIN |
| **Referencia:** | RYC2023-044188-I |
| **Correo Electrónico:** | martinschnell1981@gmail.com |
| **Título:** | Infrared nanospectroscopy for label-free ultrastructural pathology |

**Resumen de la Memoria:**

Martin has performed leading edge scientific research in the development of advanced microscopy techniques and their application in various fields, ranging from nano-photonics to biomedical imaging. Martin's approach to new challenges in science includes a combination of electrical and computer engineering, optical system design, nanofabrication techniques, numerical simulations and physical modelling.

First, Martin made key developments in near-field microscopy, including the accurate imaging of optical fields in metal nanostructures [1, 2] and spectroscopic modalities for the mapping of chemical composition on the nanoscale [3-5] (Fig. 1). These technologies are now implemented in a commercial near-field microscope (Neaspec GmbH) and provide unprecedented knowledge in many branches of science, including nano-photonics, bioimaging and semiconductor science. (1 Nature Materials, 1 patent pending)

Secondly, Martin leveraged the potential of these developments to provide first-time demonstrations of nano-optical circuits inspired by RF antenna concepts, including tuning of optical antennas by gap-loading [6] (Fig. 2) and propagation of IR radiation on an extreme subwavelength scale with metal transmission lines [7]. My work provided the much needed experimental demonstrations for initial predictions of these concepts. I have also produced results on related topics including the mapping of Fano resonances in metal nanostructures [8], chiral optical effects [9, 10], phase gradient metasurfaces [11], polarization state [1] and electromagnetic mechanism of light scattering [12] in single hot spots. (3 Nature Photonics, 2 Nature Communications, 4 Nano Letters).

Thirdly, Martin co-invented, demonstrated [13] and patented [14] synthetic optical holography (SOH), which is a very broadly applicable, holographic modality of phase imaging for scanning microscopy methods. Implemented in near-field microscopy, SOH offers a speed advantage (factor 50) over state-of-the-art technology. SOH is licensed to a company making near-field microscopes. Together with Prof. Scott Carney, I am currently exploring commercial potential for confocal microscopy for label-free bioimaging (Fig. 3). (1 Nature Communications, 1 granted patent).

Fourthly, Martin has recently co-invented infrared-optical hybrid microscopy and successfully built and demonstrated a prototype [15] (Fig. 4). This technology bridges the gap between optical microscopy and infrared spectroscopy and has the potential for transformative applications in medical imaging and material characterization. (1 PNAS, 1 granted patent).

As a next step, Martin intends to apply infrared nanospectroscopy for biomedical diagnosis, particularly to explore label-free ultrastructural pathology of cells. The expected results are (i) a documentation of the chemical composition inside the cell and (ii) to improve our understanding of conventional infrared spectroscopy-based pathology that has strong potential for clinical translation.

**Resumen del Currículum Vitae:**

Martin Schnell currently holds the position of an Ikerbasque Research Fellow at CIC nanoGUNE (Spanish tenure-track position). Previous positions include a Marie Curie postdoctoral fellowship which he spent at the University of Illinois at Urbana-Champaign. Martin obtained his PhD from the University of the Basque Country.

Martin's research is broadly defined by the development of advanced microscopy techniques and their application to fundamental and applied research in nano-optics, optical metrology and biomedical imaging. Over the course of his career, Martin has made key developments to infrared near-field microscopy (SNOM), an emerging method for IR imaging with nanoscale spatial resolution. He applied s-SNOM to explore novel optical effects in 2D and 3D nanophotonic structures, including (i) using RF circuit theory to interpret the gap loading of infrared antennas and (ii) the monitoring of pulse propagation with negative phase in hexagonal Boron Nitride. Over the last 10 years, Martin has broadened the scope of his research by developing optical interferometry techniques and applying them to label-free biomedical imaging; specifically he developed synthetic optical holography (SOH) and infrared-optical hybrid (IR-OH) microscopy. During the last 5 years, Martin advanced into the realm of developing optical theory for infrared (nano)imaging technology and nano-photonic sensors. The overarching goal of Martin's future research is to facilitate the clinical translation of nanophotonics concepts by developing novel sensing concepts and by improving our understanding of emerging IR imaging technology. To this end, Martin has established an independent research line at his current position on the optic of infrared nano-spectroscopy for biomedical diagnosis.

During the course of his career, Martin has published 31 papers in high-impact journals, including 4 Nat. Photonics, 1 Nat. Materials, 4 Nat. Comm., 1 PNAS. As proof of his independence, Martin has published 5 papers as corresponding author and 2 paper as last author. In total, these publications have gained a total of 2,400+ citations (WOS). Martin has engaged in commercial exploration including successful patenting and licensing of my optical technology. He has successfully patenting optical technology (3 US granted patents), two patents are licensed to an European company making near-field microscopes, which implemented this technology into their product line. To support his research, Martin has secured extramural funding as principal investigator (1 Proyectos de Generación de Conocimiento from the Spanish Ministry of Science, Innovation and Universities).

Martin's work is internationally well recognized by 5 invited and 12 contributed talks. Martin has also international experience by working 2 years in the groups of Prof. Scott Carney and Prof. Rohit Bhargava at University of Illinois at Urbana-Champaign (UIUC, USA) on the subject of coherent imaging and infrared spectroscopy for biomedical diagnosis. Martin has provided service to the scientific community as reviewer for international scientific journal.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | MASI , SOFIA |
| **Referencia:** | RYC2023-044709-I |
| **Correo Electrónico:** | masi@uji.es |
| **Título:** | Functional perovskite heterostructures |

**Resumen de la Memoria:**

I began my research career in 2013 within the department of Maths. and Physics of the University of Salento, Italy. I studied nanocomposite material based on perovskite and organic additives for photovoltaic applications. This led me to develop a special sensitivity for the optoelectronic, structural and morphological characterization in solid state. During my PhD thesis, I carried out a research stay of approximately two months at the Imperial College London, that allowed me to understand the impacts and consequences of organic gelators on the perovskite formation, and in turn on the solar cells improved performances and broaden my professional horizons. After defending my doctoral thesis in September 2016, evaluated as Excellent, I did a postdoctoral stay of two years in the laboratories at the CNR-NANOTEC, Italy. Then, in 2018, I applied for a postdoctoral position in the frame of an ERC Consolidator project in the laboratory of Prof. Mora-Seró at the Universidad Jaume I (UJI), Castellón, Spain, where I continued to develop my line of perovskite/additive solar cells while joining the global studies carried out by his group. As a result, I published 15 papers as corresponding author and I have participated in 8 projects, being principal investigator (PI) in three of them, one entitled STEP-UP (Proyectos de Transición Ecológica y Transición Digital, 264.500 €) is a coordinated project and another entitled She-LED (PROYECTOS DE GENERACIÓN DE CONOCIMIENTO, 84.700 €) which is an individual one, both for Ministerio de Ciencia e Innovación, plus one UJI Project on lead-free Perovskite (24.000 €). My current stage (from January 2022) as a Juan de la Cierva Incorporación researcher in the Department of Physics at the UJI is for me an unbeatable opportunity, along with the teaching Physics in the department of Physics at the UJI, to begin to build the foundations of my scientific career as a senior and independent researcher. Moreover, in 2023, I obtained the "accreditación ANECA a prof. contractada doctora" and a POSITIVE evaluation for R3 certificate. I also believe in the importance of promoting a open, participatory and social science. Therefore, I highlight the effort in attending conferences and dissemination events around the world, with a clear purpose of increasing the impact, visibility and accessibility of the work done. Between the oral participations, I received invitation at conferences like NanoGe OrgMatPerV21, MRS-Mexico Conference (Cancun) in 2020 and 2023 in SPIE OHPV-2023 (San Diego) and IPS23-EPFL (Lausanne) in 2022. Moreover, in October 2023, I carried out a stay at the Berkeley Laboratories, California after the evaluation of a competitive call, to measure at the synchrotron facilities. My current interests include the stabilization under air conditions of the perovskite materials involved in optoelectronic applications which may have profound relevance and implications for climate change and sustainability. I am also interested in understanding how supramolecuar structures based on lead-free core-shell nanoparticles can be stable in aqueous media and compatible with biological environment, looking for apply these system in photocatalytic and biolabeling applications, questions that I intend to address in the future, with my sights always set on contributing innovative and relevant ideas to the field of sustainable energy.

**Resumen del Currículum Vitae:**

Dr. Sofia Masi, (female) (1987, M. Sc. in Chemistry 2011, PhD in Bio-Molecular Nanotechnologies-Physics 2016) is a Juan de la Cierva - Incorporación 2020 postdoc researcher at the Universitat Jaume I in Castelló - UJI (Spain). In 2013 she joined University of Salento (Lecce, Italy) as a PhD student. Between 2016 and 2018 she worked at the CNR NANOTEC (Italy) as junior postdoc and in 2018 she joined the Group of Advanced Semiconductors (GAS) at the Institute of Advanced Materials (INAM) of UJI. Currently she is leading the laboratory of synthesis and fabrication of optoelectronic devices, the experiments and the scientific publications and the dissemination activities of the group. Dr. Sofia Masi has built a solid experience on perovskite solar cells and light emitting diodes (LEDs) based on perovskite/organic additives and perovskite/inorganic quantum dots systems. She has been involved in more than 25 national or European projects funded by public entities. She is PI of three scientific projects (see CVA) on perovskite quantum dots for stable LEDs (She-LED); on perovskite large area solar cells (Step-Up) and on lead-free perovskite materials (Copper perovskite). Dr. Sofia Masi has an h-index of 25 with >50 papers and more than 2500 citations (from 2015). She serves as referee for numerous journals (The Journal of Phys. Chem. Lett., En. Env. Sci., Nat. Energy, Adv. Energy Materials, she is in the reviewer board and Topic Editor of Nanomaterials, etc.) and evaluated submitted scientific proposal for Italian, Israel, Argentina and Spanish institutions. She is also guest editor of special issues in journals such as Nanomaterials or Frontiers in Materials. She attended international scientific conferences, such as NanoGe, E-MRS etc. with oral, poster or video contributions and as invited speaker for PerLightEm NanoGe 2020, OrgMatPerPV NanoGe 2021, EPFL 2022, SPIE San Diego 2023, MRS-Mexico 2023, MATSUS 2024), led original dissemination activities (European, Spanish or Italian initiatives), by social media and as video-maker and developed relations with academic networks. She was co-director of a PhD student, with a doctoral thesis entitled "Perovskite-quantum dots based solar cells and light emitting diodes" at UJI (Thesis defense date May 2022) and currently she is the director of other three PhD students (Olfa Selmi, Gisela Vanesa Cappari and Fabián Pino; thesis defense date 2026). Current research activity is focused on the thermodynamic stabilization of unstable photoactive perovskite crystal phases, to improve the efficiency and the stability in ambient conditions of both the material and the devices, and also on semitransparent devices for building integration and on core/shell materials for improved LEDs devices. Dr. Sofia Masi is also featured along with other outstanding women at the forefront of energy research (ACS Energy Lett. 2021, 6, 58-68).

Along with the research activities it is worth to mention the teaching appointment in the department of Physics of the University Jaume I. Dr. Sofia Masi is teaching Physics I and II (theory, problems and laboratories); in 2023 she received also a positive evaluation for the "R3 certificate" and the ANECA "accreditación a Prof. Contractada Doctora".

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | FERRÁNDEZ MONTERO, ANA |
| **Referencia:** | RYC2023-043957-I |
| **Correo Electrónico:** | anafm92@gmail.com |
| **Título:** | Processing of hybrid materials with new bioactive and electroactive functionalities for tissue engineering |

**Resumen de la Memoria:**

The main scientific challenge the researcher candidate addresses is to understand the influence of the processing variables as well as microstructural and compositional design of biomaterials on the bone recovery process in terms of biochemical stimuli, such as bioactivity or biodegradation, exploring and understanding the effect of biophysical stimuli such as electrical and mechanical signals.

The candidate developed her PhD (10/2018) and early postdoctoral stage in the frame of a national and international scientific projects. She demonstrated her exceptional level of independence during her early postdoctoral period in Spain focusing effort to introduce two unprecedented research lines at the ICV-CSIC: an independent line on processing of biodegradable and a transversal line on the processing of hybrid materials by additive manufacturing techniques. The research she developed during this early stage period generated a patented that later was licensed by the Start-Up COLFEED4Print cofounded by the candidate. Later, during her postdoctoral research stage of 2 years in CY Cergy Paris Université (CYU), she had the opportunity to work in the multidisciplinary projects 3DSTIM (INEX-Initiative of Excellence and Internationalization), aiming the use of conductive polymers to develop smart 4D porous materials. She worked coordinately between the Laboratory of Physicochemistry of Polymers (LPPI) and the Research lab of Extracellular Matrix and Cells (ERRMECe) boosting a multidisciplinary research between a laboratory specillazided in polymer chemistry and other in cell biology. She was able to bridge both disciplines thanks to her experience in both fields. In this context she obtained her own financial support to supervise a master student and her first PhD student.

In January 2021 the candidate joined the ICV-CSIC in the frame of the research network ADITIMAT-CM, during this time with the spin-off she awarded as principal investigator the project NEOTEC funded by CDTI. This project aims to achieve the medical certification of one of the composite biomaterials developed by the candidate. In 2022 the candidate was awarded with the Atracción de Talento project "Hybrid 4D materials with new bioactive and electroactive functionalities for bone tissue engineering" funded by Comunidad de Madrid. In this project she is exploring new multifunctional hybrid biomaterials for bone and tissue regeneration adding innovative active functionalities, such as electrical or electroactive signals, to the current implants with passive osteoregenerative properties. Within the framework of this project, is supervising her second PhD student now on the bioprinting of electroactive materials for tissue regeneration applications. The candidate continues her research career as PI in 2 recent projects where she is exploring the incorporation of other innovative functionalities to different biomaterials. An European MSCA Staff Exchange project aiming the incorporation of natural biopolymers as antimicrobial agents and a national "Generación de Conocimiento" project where she is applying her expertise in additive manufacturing and biomaterials to develop new hierarchical ceramic structures such as different biodegradable profiles and mechanical properties gradients, with combined properties.

**Resumen del Currículum Vitae:**

From 2023, the researcher has a Tenure Track position "Atracción de Talento" at the Institute of Ceramic and Glass (CSIC). Her PhD and early postdoc were framed in international (M-ERA.NET2016) and national (MULTIMAT-CM, ADITIMAT-CM) scientific networks/projects. During this period she obtained her own European Mobility grant JECSTrust to carry out a predoctoral stay in the Institute of Biomaterials (Erlangen, Germany), under the supervisor of Prof Boccaccini. The PhD thesis about colloidal processing of biometals was awarded with the IV AMES-Joan Antoni Bas Award (2000€) to the best R+D+I work in powder metallurgy. The methodology described during this period was patented (PCT/ES2019/070348) being her the first inventor and patent was licensed to the start-up COLFEED4Print that commercializes 12 products based on her developments. In 2020 she co-founded this startup ( COLFEED4Print, holding a 10% equity) where she is the responsible of the biomedical product line (https://colfeed.com/). During her postdoctoral stage of 2 years in CY Paris Université (2020-2022), the researcher worked in the projects 3DSTIM of INEX-Initiative of Excellence between the Group of Physicochemistry of Polymers (LPPI) and the Group of Extracellular Matrix (ERRMECe). During this period, she led her own project funded by I-Mat Federation of Materials Science Institutes with her own working group supervising 1 MSc student and 1 (ongoing) PhD student. She has led a total of 6 project and one more submitted. She was PI of a granted project in ALBA synchrotron facilities (Standard Proposal NCD-SWEET 2021095332). She is the scientific responsible of the NEOTEC 2021 CDTI project (SNEO-20211395, FILAMENT- Oss) to obtain the medical certification of one of her developments. She is PI of other 3 research project, the project "3D printing of electroactive scaffolds for bone regeneration" Programa de Atracción de Talento" de la Mod.1. (CAM 2022-T1/IND-23973), of the European project MSCA Staff Exchange project NET4MAT(HORIZON-MSCA-2022-SE-01-01) and of the Proyecto Generación de Conocimiento 2022 coordinated 3DPOSTPERFORM (PID2022-137274NB-C31). She is PI of 3 industrial contract with companies and technological centers. She is co-author of 23 Q1 publications (H10, 330 cites in Scopus), a book chapter and 2 more sent publications. Following the DORA principles, she is first author/corresponding author of the 50% of her publications. She presented her work in more than 30 national and international congress, and she has 8 invited conferences. She has been guest editor of three Special Issues of Polymers, Pharmaceuticals and Open Ceramics. She belongs to the Dissemination Committee of the ICV-CSIC. She was involved in the organizing committee of 2 editions of the YCGMed  sponsored by SECV and ECERS and 2 editions of the JJI-ICV  sponsored by ICV and SECV. She was also the organizer of the Additive Manufacturing symposium sponsored by ACERS in the LVIII SECV Congress and she is organizing it in the LIX SECV Congress being also part of the Organizer Committee as Content and Social Networks Manager. She will take the same position in the SECV Organizer team from 2024. Finally, she is supervisor and director of 2 PhD students, and she has supervised 3 predoctoral stays and 15 student projects and taught Master Courses at UPM, CYU Université and UNED.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | PATIÑO PADIAL, TANIA |
| **Referencia:** | RYC2023-045329-I |
| **Correo Electrónico:** | tania.patino.padial@gmail.com |
| **Título:** | DNA-based nanorobots for specific and selective cell recognition |

**Resumen de la Memoria:**

After my PhD in Cell Biology, where I studied cell-nanoparticle interactions for biomedical applications, I moved to IBEC and started working on self-propeld biomedical micro- and nanorobots. In 2019, I moved to the University of Rome tor Vergata with a Marie Curie Individual fellowship to employ DNA nanotechnology on the design and fabrication of smart nanorobots with sensing and drug delivery capabilities. Since 2022, as group leader at TU/e, I have harnessed my unique multidisciplinary background (cell biology, motile nanosystems, DNA nanotechnology) to develop a new class of DNA-origami based nanorobots. While successful in vivo studies show great promise for their use in precision medicine, the field is still under development and several challenges need to be addressed to guarantee a safe and efficient clinical translation. A very important aspect is the lack of understanding on the molecular mechanisms that underly the interactions between motile nanosystems and cells. When envisioning targeted therapeutics, specificity and selectivity are crucial to guarantee maximized efficiency and diminished off-target effects. In this regard, it is of great importance to understand how the motility of nanorobots may affect ligand-receptor binding kinetics, a key aspect in specific and selective cell recognition. Addressing this scientific question is currently challenging due to the need for a platform that allows to combine molecular patterning of ligands with motile elements.

Herein, I aim at tackling this issue by designing three different-yet synergistic objectives: (i) I will employ synthetic DNA for the design of fully biocompatible and programmable nanorobots, with unprecedented precise molecular patterning. I will develop different prototypes that combine cell targeting and motile elements in a controlled manner for optimal motility. (ii) I will study the effect of nanorobot motility on cell targeting specificity, by characterizing the binding dynamics of ligand-functionalized nanorobots with cell surface receptors. (iii) I will investigate how motility affects multivalent ligand-receptor interactions to maximize selectivity. Finally, optimal nanorobots in terms of specificity and selectivity will be tested as a proof-of-concept for the inhibition of cancer cell proliferation by targeting the EGFR receptor.

Altogether, the results arising from the different objectives will lead to new insights into understanding of the effect of motility on cell-nanorobot interactions.

**Resumen del Currículum Vitae:**

I am a cell biologist by training. My scientific curiosity about how cell behaviour could be modulated by interactions with nanoparticles brought me to pursue a PhD on this topic at the interface between biology and nanoscience. My PhD thesis (Cum Laude) was awarded with the international mention and received the Extraordinary Prize by the Autonomous University of Barcelona. In 2016 I became fascinated by the emerging field of nanorobots and the possibility of powering them using bioavailable fuels. This motivated me to obtain the highly competitive individual Post-Doctoral fellowship Juan de la Cierva-Formación (ranked 7/240), through which I started a new research line on the development of nanorobots for biomedical applications, leading a sub-team of 2 PhD, 1 PD and 2 technicians at the Smart Nano-Bio-Devices group (Prof. Sánchez), IBEC. I started and led pioneering studies on the development of enzyme-powered nanorobots for biomedical applications and I acquired research funding. I reported for the first time that molecular asymmetry is enough to propel micromotors and intrinsic enzymatic activity has a crucial role in micromotors motion dynamics. I employed my biological background to design urease-based nanorobots for the enhanced delivery of anti-cancer drugs and improved targeting of 3D bladder cancer spheroids. The team I led demonstrated for the first time that nanorobots can be monitored in vivo by medical imaging and can accumulate in bladder tumours with higher efficiency than passive particles. In 2019, I demonstrated my independence thinking and leadership by obtaining a Marie Skłodowska Curie (MSCA) Individual Fellowship (Score 97/100), to move to Prof. Ricci' s lab (UTOV, Italy). There, I strengthened my international experience, network and scientific profile and found innovative solutions for a higher degree of controllability over nanorobot design and functionalities and obtaining the first DNA-enzyme nanoswimmers. Now as group leader at TU/e (Netherlands) I have established my own research line in biomedical nanorobots with programmable design, biocompatibility and motion control. So far, I secured funding as PI from the ICMS immunoengineering program (250k€), and the Irene Curie Fellowship (100k€). My scientific contributions have led to intellectual property patented, the creation of the spin-off Nanobots Therapeutix and the acquisition of funding from public sources (BIST-IGNITE, 20k€, on the development of new materials for nanorobots; Fundación Cugat, 50k€, on nanorobots for joint therapy) and contracts with private companies (Lipofoods S.A., 12k€, Lipotec S.L., 140k€, on drug screening platform development based in biohybrid actuators) in which I was co-PI.

My work led to publications in international journals as first and/or co-corresponding author, prizes invited and keynote talks at international conferences. Additionally, my work has also attracted the attention of different national and international media ( TV and newpapers). Besides my core research activities, I actively participated in educational and outreach activities such as the "Bojos per la Bioenginyeria" (La Pedrera Foundation) program; the "Magnet" (Bofill Foundation) program trough partnering with schools at risk of social exclusion; Leadership in Action Program (BIST) aimed at young post-docs to improve leadership skills; mentoring and supervision of young students (4 Bachelor, 12 MSc and 2 PhD, 1 PD) and divulgate science fairs.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | PESQUERA HERRERO, DAVID |
| **Referencia:** | RYC2023-044643-I |
| **Correo Electrónico:** | dpesquera@gmail.com |
| **Título:** | Freestanding Perovskite Membranes: A Novel Playground for Complex Oxide Physics and Integrated Devices |

**Resumen de la Memoria:**

My research career has been focused on the study of Transition Metal Oxides (TMO). TMO are complex material systems that can display a wide range of functionalities (including high-temperature superconductivity, colossal magnetoresistance, metal-insulator transitions, strong magnetoelectric coupling, or large catalytic activity), making them highly appealing for a wide range of applications (including nanoelectronics, information storage, sensors, actuators or catalyzers). These oxide materials can be used in almost any application that requires an active response to an external stimulus, nevertheless their complexity and challenging integration into current technological platforms have restricted their implementation in real-world applications.

With my research I have contributed to increasing the microscopic understanding of the physics of TMO by using single crystal systems and epitaxial films to obtain a precise control over chemistries and structures, needed to access the couplings between the crystal lattice of TMO and the electronic degrees of freedom (spin, charge, orbital), explore structure-properties relationships and demonstrate active control of functionalities in proof-of-concept devices that can open the way to new energy efficient technologies (such as high-density magnetoelectric random access memories operating at ultralow voltage) and energy conversion strategies (such as solid-oxide fuel cells, electromechanical or photomechanical transductors).

A central part of my specialization in the recent years has been the fabrication and study of the properties and microstructure of freestanding single crystal nanometric oxide films. This field of study has blossomed in the last 5 years and I have actively contributed to push forward the knowledge in this area, in which I have published 3 high impact articles and 1 invited topical review. By optimizing and exploiting the particular characteristics of these freestanding films, I have provided new tools to further explore novel physics in oxides and, at the same time, to enable their integration into the aforementioned current technological platforms such as silicon or flexible polymers.

**Resumen del Currículum Vitae:**

I have developed my research under competitive funding (FPI, Beatriu de Pinós, Marie Skłodowska-Curie and La Caixa Junior Leader fellowships) in four different research institutions (ICMAB, University of Cambridge, University of California Berkeley, ICN2) and five different groups, doing research stays at six European institutions, and collaborating with >20 internationally recognized groups. This broad interaction has allowed me to acquire a solid background on condensed matter physics and nanotechnology, and a strong expertise in thin film synthesis, nanofabrication, magnetic, electrical, mechanical, optical and thermal characterization. I have published a total of 27 peer-reviewed articles (10 as first author) with >1000 citations (H-index 19), including prestigious journals such as Nature Materials, Nature Communications and Physical Review Letters, and 3 topical reviews. I have led several projects (including BIST Ignite and a Knowledge Generation project), presented my research in international conferences (2 as invited speaker) and been recognized as established researcher with an R3 certificate. Currently I am principal investigator of a second Knowledge Generation project, and I am co-supervising 3 PhD students.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | YIN , GUANG-ZHONG |
| **Referencia:** | RYC2023-045023-I |
| **Correo Electrónico:** | ygzamos@foxmail.com |
| **Título:** | Researcher (Sustainable polymers) |

**Resumen de la Memoria:**

I received my PhD degree in Materials Science and Engineering at Beijing University of Chemical Technology (BUCT) in 2016. My thesis topic was about the biodegradable polymeric functional materials. In July 2016, I moved to the College of Chemistry and Molecular Engineering at Peking University as a postdoctoral fellow in Prof. Wen-Bin Zhang' s group. I then worked at China Textile Academy for near one year as senior engineer. In April 2019, I joined Prof. De-Yi Wang's group in IMDEA Materials Institute (Spain) as a research associate. In January 2022, I moved to Universidad Francisco de Vitoria (UFV) as a full-time researcher. I am also the adjunct researcher at IMDEA Materials Institute from March 2022. My recent research mainly focuses on biomass polymeric functional materials, phase change materials (organic), smart materials, and bio-based fire-safe nanocomposites. Following are some typical research interests (lines):

(1) Biomass polymeric functional materials and Bio-based fire-safe nanocomposites. Develop the novel bio-based flame retardant with high commercial prospect; Natural macromolecules application exploration e.g., aerogel, and 3D form-stable PCM; and 3D-printing of the high-performance biodegradable polymeric materials.

(2) Energy materials: Bio-based fire safe PCM and Thermoelectric generator (TEG). PLA based PCM; Biobased intrinsically fire safe PCM work substances; and Flexible polymeric TEG.

(3) Sustainable Smart materials and Sensors. Biodegradable shape memory materials for 4D printing: PCL based and PLR based; Biobased hydrogel sensors for healthcare; and Thermoelectric devices for sensor.

(4) Tissue engineering polymeric materials. Polyester (PCL and PLA) application in bone and skin regeneration; and Biobased hydrogel for tissue regeneration.

**Resumen del Currículum Vitae:**

With a h-index of 20 and total citations of ~1000 (Google Scholar), I published 60+ peer-review articles or chapters (45+ of them are in Q1 journal, 35+ of them are published as first author or corresponding author, and 1 was selected as hot paper) in top international journals, e. g. Energy Storage Materials, Chemical Engineering Journal, Materials Horizons, Journal of Material Chemistry A, Macromolecules, etc. I filed or authorized 2 PCT patents, 1 European patent, and 1 Chinese patent. I was invited as the reviewer for top journals, e. g. Advanced Functional Materials, Carbohydrate Polymers, Chemistry-An Asian Journal, Journal of Energy Storage, etc. I was invited as a guest editor for the materials (MDPI) from August 2021. In 2023, I was selected as Youth Editorial Board Member for the international journal, Nano Research Energy (Cite score>30), and Nano Materials Science (IF=9.9).

I was involved in some national projects funded by both National Natural Science Foundation of China (NSFC) and Ministerio De Ciencia E Innovación (MINECO) (Spain, as key research team member, and writing the proposal draft) such as BIOFIRESAFE (2021) and DIGIBIOFAM (2022), and internal fundings (as PI or Co-PI in both Pecking University and UFV). In July 2023, I received a funding (NEWSAFE, PID2022-143324NA-I00) from the Ministerio De Ciencia E Innovación (MINECO) as the only Principal Investigator. In 2020, I won the Marie Skłodowska-Curie Actions (MSCA) Seal of Excellence. In 2021, the same proposal for MSCA Postdoctoral Fellowships 2019 was funded by the Ministerio De Ciencia E Innovación (MINECO) (Spain), and I am a team leader in most of the work packages. In 2021, I won the bronze award of the first National Postdoctoral Innovation and Entrepreneurship Competition (China), and Excellent postdoctoral fellow in innovation and entrepreneurship in China. In 2023, I was selected as MSCA fellow with full marks (100/100) and ranked 1st among 6334 European fellowship proposals.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | PASTOR PÉREZ, LAURA |
| **Referencia:** | RYC2023-045149-I |
| **Correo Electrónico:** | laura.pastor86@gmail.com |
| **Título:** | Materials design and synthesis for energy and environmental applications |

**Resumen de la Memoria:**

Laura is a Senior Research Fellow (Juan de la Cierva Inc) at the Material Sciences Inst.—Inorg. Chem. Dept., US-CSIC. She graduated with PhD Cum Laude in Materials Science at UA where she specialized in materials design and synthesis for energy and environmental applications. Since she graduated from PhD, she accumulates 7.5 years of postdoctoral experience (1 year at University of Alicante, over 3 years in the UK and 3.5 years at University of Seville). She possesses a solid international experience (41 months) upon spending a postdoctoral period of over 3 years in the UK working at the Chemical Eng. Depts. of the Imperial College London and University of Surrey plus a 3 month placement at Utrecht University during her PhD. Laura has made multiple scientific contributions to the field of materials science for CO2 valorization, biomass upgrading, H2 production and low-carbon energy technologies. She began her scientific career working as PhD student in the design of catalytic materials for green H2 production at the Advanced Materials Laboratory, UA. Key publications derived from her PhD are co-authored only by two authors (herself and her PhD advisor) evidencing a high degree of maturity and leadership from her early career stage. Laura's postdoctoral period in UK brought new research avenues and she specialized in two hot topics: materials for CO2 valorisation and biomass upgrading. The former was the central topic of her work at Surrey where she co-supervised two PhD theses in the field. The later was the core activity of the PI project at Imperial College (APOSTD). Upon completing a fruitful international period Laura rejoined the Spanish academic system in late 2020 being awarded a JIN-project (PI) and later on a Juan de la Cierva contract at Materials Science Institute of Seville. This recent period marks a threshold on Laura's career in which she has consolidated her research leadership opening new research lines at her current institution. She is working on materials for biogas upgrading via thermal and plasma catalysis routes under the ADVENTURE-project as a PI while she is also exploring new materials for biofuel production processes and expanding the horizons of catalytic materials for CO2 conversion in realistic flue gas streams as part of the Juan de la Cierva contract. In these areas she is currently co-supervising 4 PhD students.

Laura¿s current research is devoted to tackle the so-called Global Challenges with a strong emphasis on Materials for Energy and Low Carbon Energy Technologies. The development of catalytic materials for the conversion of CO2 to added value chemicals such as acetic acid is one of Laura¿s open battles, project dealing with the application of plasma catalysis and structured materials for the conversion of CO2/CH4 mixtures into acetic acid. Both plasma catalysis and structured materials are entirely new fields for Laura taking her out of her comfort zone from previous pre and postdoctoral experience.

Further to plasma catalysis, Laura is pursuing different materials for low carbon energy routes via the development of catalytic materials for biomass upgrading. In the context of a circular economy, the utilisation of bio-waste to produce both materials and added value fuels is, for instance, an interesting approach that still requires further research in aspects such as catalyst development.

**Resumen del Currículum Vitae:**

Laura obtained a Degree in Chemistry (2010) and a Master in Materials Science (2011) at the University of Alicante (Spain). Further on, she graduated with a PhD in Materials Science (2016) at the University of Alicante. Within her doctoral studies she gained a strong background in material science, chemistry, heterogeneous catalysis and reaction engineering. Her research in catalytic materials has been recognized by the scientific community with several awards, including (i) Real Sociedad Sevillana de Ciencias Award, 2023; (ii) The XI Losada-Villasante award in circular economy, 2023; (iii) extraordinary PhD award by the Doctoral School at the UA; (iv) the best Thesis award 2016 by the Spanish Royal Society of Chemistry (Alicante division)

Laura is a Senior Research Fellow (Juan de la Cierva Inc) at the Material Sciences Inst.—Inorg. Chem. Dept., US-CSIC. She graduated with PhD Cum Laude in Materials Science at UA where she specialized in materials design and synthesis for energy and environmental applications. Since she graduated from PhD, she accumulates 7.5 years of postdoctoral experience (1 year at University of Alicante, over 3 years in the UK and 3.5 years at University of Seville). She possesses a solid international experience (41 months) upon spending a postdoctoral period of over 3 years in the UK working at the Chemical Eng. Depts. of the Imperial College London and University of Surrey plus a 3 month placement at Utrecht University during her PhD. Laura has made multiple scientific contributions to the field of materials science for CO2 valorization, biomass upgrading, H2 production and low-carbon energy technologies.

In these topics Laura has co-authored ~86 peer-reviewed publications, 5 book chapters, 76 conference contributions (3 invited keynotes) 1 patents (transferred and under commercialization by Green Gas Catalysts Ltd.) and 1 edited book (+1 ongoing). Her contribution to the mentioned outputs is remarkable since she is first/corresponding author of ~30 publications and ~25 publications derive directly from PhD projects she has supervised. Many of these works reflect her close cooperation with industrial and international academic partners. Laura maintains active collaborations with colleagues in England, China, Germany, France, Chile, Scotland, etc.

She is also co-supervisor of 6 PhD thesis (4 currently ongoing) and multiple master thesis projects.

Along with her research background, Laura possesses commendable expertise in undergraduate teaching (>800 hours of teaching experience in national and international institutions) being involved in several modules at the University of Alicante (Spain), University of Surrey (UK) and University of Seville (Spain) as well as being an invited lecturer for Beijing Forestry University (China). She is accredited as Assistant Professor (Profesor Contratado Doctor) by ANECA.

As for management and collegiality duties, I have organized international workshops, and I serve as associate or guess editor in several journals including Frontiers in Chemistry, Catalysts and Sustainable Chemistry among others. She has participated as PI or team member on multiple projects in the area of catalytic materials and processes for energy and environment sponsored by multiple institutions such as EU-H2020, Spanish Ministry of Sciences, AEI, EPSRC, Royal Society, and British Council.

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Ciencias y tecnologías de materiales
**Nombre:** TOPETE CAMACHO, ANTONIO
**Referencia:** RYC2023-045732-I
**Correo Electrónico:** topete.antonio@gmail.com
**Título:** Theranostic nanosystems combined with cellular immunotherapies for cancer treatment - Antonio Topete

**Resumen de la Memoria:**

In recent years, nanotechnology and (bio)materials have had a tremendous impact on biomedical and pharmaceutical industries. My career has been focused on the field of nanomedicine, developing hybrid photo-activated nanoparticles with potential applications in the diagnosis and treatment of cancer.

I finished my PhD (2013) at the University of Santiago de Compostela under the supervision of Prof. Pablo Taboada, Prof. Silvia Barbosa and Prof. Víctor Mosquera, with "summa cum laude" by unanimous decision and the first prize for Best PhD Thesis on Materials Science and Engineering granted by UNAM (Mexico). The PhD was funded thanks to a competitive Grant for Doctoral Studies Overseas from the National Council of Science and Technology (CONACYT, Mexico). My PhD research was focused on the development of biocompatible and multifunctional theranostic nanostructures devoted for simultaneous diagnostics and treatment of cancer. I conducted a research stay at the Biophotonik Lab at the Phillips University Marburg (Germany) led by Prof. Wolfgang J. Parak.

I have coauthored 42 articles (Scopus: h index 17 - 805 citations; Google Scholar: h index 18 - 951 citations). I hold five patents applications and have supervised 4 PhD theses, 2 MSc. theses and 5 Bachelor's degree theses. I have participated in several international and national congresses, including 14 as a speaker and one Plenary Conference in Chile. I obtained the R3 certification.

Currently, my research work aims to develop novel biomimetic theranostic nanosystems combined with adoptive cellular immunotherapies for the personalized treatment of cancer. The objectives of my research line are:

i) To develop photoactivated nanotherapies against challenging cancers, such as pancreatic ductal carcinoma, triple negative breast cancer and glioblastoma. In this regard, I will harness the use of immune cells such as Natural Killer cells, that have a natural tropism for the tumor microenvironment and has been proved they can deliver theranostic nanoparticles to solid tumors.

ii) To combine these nanotherapies with cell immunotherapies, for instance, CAR-NK cells, and immune checkpoint blockade antibodies to deploy a multifront cancer therapy. Also, I want to target not only the tumor parenchyma, but the aberrant stroma of tumors of, for instance, pancreatic cancer, as this is the main cause of failure of conventional therapies against this tumor, making it almost insensitive to chemo-, radio-, and immunotherapies.

ii) To use tumor extracellular matrix re-modelling strategies such as delivery of collagenases and hyaluronidases, and modulators of molecular cues involved in the aberrant production of collagen (e.g. inhibitors of focal adhesion kinases, FAKs). The subsequent step will be to evaluate the ability of this photoactivated therapies, e.g. photodynamic therapy and plasmonic photothermal therapy, to re-shape the immune tumor microenvironment, specially to induce a transition from an immunosuppressive to an immune-responsive tumor microenvironment.

iv) Ultimately, to evaluate these sequential and combinatorial multi-perspective therapeutic approaches in sophisticated fully immunocompetent 3D bioprinted stroma-tumor models, and ultimately in humanized mice models, to determine efficacy, safety, and potential adverse unwanted responses.

**Resumen del Currículum Vitae:**

Antonio Topete holds a bachelor's degree in chemical engineering (University of Guadalajara). Then, he was granted with a competitive CONACYT grant (#226339) to obtain a master's degree in chemical engineering from the University of Guadalajara, Mexico. Thereafter, he was granted with a competitive CONACYT grant for doctoral studies overseas (#308128). He commenced his doctoral studies under the guidance of Prof. Silvia Barbosa, Prof. Pablo Taboada, and Prof. Víctor Mosquera. He obtained a PhD in Materials Science (2013) from the University of Santiago de Compostela, Spain, with the presentation of the thesis entitled "Development of hybrid nanoplatforms for theranostic applications", which obtained the qualification of "summa cum laude" by unanimous decision and subsequently received, for example, the first prize for Best Thesis on Materials Science and Engineering granted by the Institute of Research on Materials of the National Autonomous University of Mexico – UNAM. The focus of his thesis was on the development of hybrid nanoplatforms for cancer theranostics. Notable achievements include winning the first prize in the Science category of Jalisco's Innovation, Science, and Technology award (2020).

In 2012, Antonio conducted a 3-month research stay in the Biophotonik Group at Philipps University Marburg, Germany, supervised by Prof. Wolfgang J. Parak. After completing his PhD, Antonio Topete returned to Mexico as a competitive postdoctoral fellow at the Metropolitan Autonomous University of Mexico, in the Group of Dr. José Campos Terán. Subsequently, he secured a competitive Repatriation grant from Mexico's National Council of Science and Technology, leading to a full-time professor/researcher position at the Health Science Center of the University of Guadalajara.

He has coauthored 42 articles (Scopus: h index 17 - 805 citations), 22 in Q1 journals (7 in D1, 13 as first author/corresponding author) journals, and 10 of them have been published in open access. Antonio research is supported by 14 research projects, three as Principal Investigator (PI), across Mexico, Chile and Spain. He has supervised 4 PhD theses, 2 MSc. theses and 5 Bachelor's degree theses. He has participated in several international and national congresses, including 14 as a speaker and one invited Plenary Conference in Chile. In 2024, He obtaind the R3 certification as an established researcher in the 2023 annual performance assessment by the Spanish State Research Agency.

His significant contributions to the field of nanomedicine include the development of novel and synergistic strategies, combining nano(chemo-photo)therapies and immunotherapies, and the creation of nanoparticle fabrication methods that utilize sustainable materials and energy-efficient processes, showcasing the potential for groundbreaking advancements in nanomedicine applied to cancer treatment. He is currently Head of the Nanomedicine Area within the Laboratory of Immunology at CUCS-University of Guadalajara. Antonio has played a crucial role in demonstrating the utilization of Natural Killer cells (NK cells) as carriers of theranostic nanoparticles to cancerous cells, leading to 5 published patent applications in Mexico, USA and in UE. Recently, Antonio obtained a María Zambrano grant and holds a 2-year contract (2023-2025) as research associate at the University of Santiago de Compostela.

**Resumen de la Memoria:**

My research aims to understand the underlying mechanisms by which organisms control the mineralization process, with emphasis on bone formation. I completed my PhD on the ultrastructure of nacre tablets, focusing on the presence of macromolecules on the mineral structure and their role as stabilizers of the amorphous phases. During my research stays at the Fritz Haber Institute of the Max Planck Society, I learnt to operate a Transmission Electron Microscope and adapted metallographic techniques for the study of biominerals.

During my postdoctoral period at the Max Planck Institute of Colloids and Interfaces I had the opportunity to collaborate in a variety of research topics, ranging from bone mineralization, biomimetic synthesis of magnetite, and biofabrication of polymeric materials. During these three years, I gained significant theoretical and practical experience in several techniques, particularly on electron microscopy. I operated (on a weekly basis) a double Cs-corrected TEM (Jeol JEM-ARM200F), which allowed me to develop a powerful approach for the study of complex hierarchical (bio)materials, combining S/TEM imaging with chemical mapping (EDS and EELS) and diffraction.

At the Radboud University Medical Centre, I focused on collagen mineralization, studying the effects of carbohydrates (both glycation and glycosylation) on the mineralization process. I was deeply involved in the development of new dynamic imaging methods for the study of biological processes, with main goal of studying the mineralization process in situ.

By combining my biological background with the advanced analytical techniques of the materials science community, I aim to take a step forward by applying my current knowledge to bone pathophysiology. Whereas my previous trajectory has been focused on a basic science perspective aimed at understanding the early stages of mineralization, the line of research I propose has a strong applied character, with the aim of a better understanding of diseases including the causal links between health determinants and diseases.

By increasing the scientific knowledge of the fundamental mechanisms that drive bone mineralization, and delving into the changes it undergoes during degenerative pathological conditions, this line of research will contribute in the long-term to reducing the economic and social burden of the skeletal diseases (Horizon Europe Work Program 2023-2024, destination 3).

**Resumen del Currículum Vitae:**

I obtained a predoctoral fellowship (budget 81.536,3 €) associated to the Excellence Research Project "Biomaterials with biomimetic interest: nacre and related microstructures" that allow me to perform my doctoral studies. In 2017 I joined the Biomaterials department with a postdoctoral contract for 3 years. In 2020, I joined the department of Biochemistry at Radboud University Medical Centre (NL) as an Assistant Professor. I obtained a Marie Sklodowska Curie Individual Fellowship (187.572,48 €), which allowed me to initiate an exciting research line on the study of collagen mineralization in liquid (DYNAMIN). In parallel, I participated (as co-applicant and member of the Steering Committee) in a multi-million euro project aimed at establishing an international facility for the study of biochemical processes in liquid (NWO Large BIOMATEM). A state-of-the-art microscope, specially configured for the study of liquid samples, has been recently installed at Radboudumc (June 2023): the first facility dedicated to LPEM at the European level.

In 2022, I joined the UGR as a Juan de la Cierva Incorporation fellow and obtained the ANECA Profesor Contratado Doctor certificate. I successfully applied for the State Program for Knowledge Generation (as sole PI), securing funding of 118,750€. In 2023 I received the Outstanding Paper Award (Life Sciences) from the European Microscopy Society.

I have published 28 peer-reviewed papers, some of them in broad audience journals (PNAS, Nature Communications, Advanced Functional Materials), plus two technical chapters. In addition, the publications of the doctoral thesis I supervise (for which I am corresponding author) are currently under review (available as preprints in open access repositories). I have attended international conferences of diverse fields (35 communications) and have had the pleasure of being invited (as invited speaker) to some prestigious congresses. My work has contributed to deciphering the structure-function relationships in complex hierarchical biomaterials.

I have also been part of the organizing committee of 3 international conferences: COST Biomineralix TD0903 Action (Granada, 2014, ~40 attendees); Biomin 13 (Granada, 2015, ~150 attendees); MCOII (Berlin, 2019, ~90 attendees), where I gained experience in planning scientific meetings and finding sponsors.

Training of young doctors: During my postdoc I mentored 4 PhD students and 1 technician, guiding their experiments and training them in EM sample preparation. During my time at Radboudumc, I trained one technician on TEM and supervised 2 MSc students: Liline Fermin on "Increasing the degree of glycosylation and determining its effect on the structure of collagen type I" and Jinge Xu on "The effect of glycation on collagen mineralization". At the UGR, I supervised an MSc student from the Master of Biotechnology, Nuria Sanchez Herrera, on "Optimization of synthesis properties in in vitro models of collagen for bone regeneration".

Since 2020, I have been co-supervising (as co-promotor) a PhD student at Radboudumc, Luco Rutten on a thesis about "The influence of carbohydrates on the mineralization of collagen associated with bone formation" (expected defense date June 2024).

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | LAFUERZA BIELSA, SARA |
| **Referencia:** | RYC2023-044034-I |
| **Correo Electrónico:** | saralafubielsa@gmail.com |
| **Título:** | Complex ferroic oxides with novel functionalities: understanding the physical properties applying advanced synchrotron-based X-ray spectroscopies |

**Resumen de la Memoria:**

I began my research career in 2009 as postgraduate student at Instituto de Ciencia de Materiales de Aragón (ICMA), working a project on synchrotron X-ray absorption spectroscopy (XAS) applied to ferroelectric oxides. I then obtained from Universidad de Zaragoza a MSc in Physics and Physical Technologies in 2010 and a PhD in Physics in 2014 supervised by Dr. G. Subías and Prof. J. García at ICMA. In my MSc thesis, I learnt to perform XAS ab initio simulations in a research stay at Institute de Physique de Rennes (France) and I published my first manuscript -1st author-. During my PhD, I studied potential multiferroic oxides combining physical properties measurements with synchrotron experiments. In particular, the results achieved with electrical characterization and synchrotron techniques on the presumed multiferroic $LuFe_2O_4$, provided a new perspective to the physical and electronic properties of this renowned material.

To develop further my skills in advanced synchrotron techniques, I continued my career at the X-ray absorption and emission spectroscopy (XAS-XES) beamline ID26 at the European synchrotron. First as post-doc (2014-2015) and then as 2nd beamline scientist (2015-2020), besides managing my own scientific program, I worked in the instrument operation: support in >25 user experiments, instrumentation commissioning, training of post-docs, etc. I led a research line on XAS-XES applied to strongly correlated systems to study the local electronic (charge and spin) and geometrical structure. I managed and participated in several synchrotron peer-reviewed projects (4 as PI), fostering new international collaborations and extending my previous background in bulk ferroic oxides to other systems (e.g. iron pnictide superconductors, colloidal $Fe_3O_4$ nanoparticles studied in-situ in a liquid jet setup with magnetic field that I developed). I also contributed to promote the application and understanding of XAS-XES spectroscopies by conducting a benchmark XES systematic study and reviewing the state-of-the-art. Besides, I was part of the Early Career Investigators of a EU H2020 COST Action on spectroscopy for advanced materials, participated in several Spanish research projects and was invited to the Institute of Physics in Warsaw (Poland) for a short research stay.

Since 2021, after being awarded with the EU H2020 Marie Curie - Individual Fellowship (MSCA IF) project EAGER "Exploring Aurivillius phases for Green Electrocaloric Refrigeration" (172.9 k€ of which 19.2 k€ for research, training & networking), I work as postdoctooral researcher at Instituto de Nanociencia y Materiales de Aragón (INMA). In EAGER, I combined in-house-developed thermal and electrical characterization methods with advanced X-ray spectroscopies in the study of new electrocaloric oxides, including bulk and thin films prepared in research visits at Instituto de Ciencia de Materiales de Barcelona (ICMAB). Currently, I am holding a 1.5-years extension of EAGER by CSIC (competitive internal call) to finalize the MSCA IF and apply for an ERC project on multicaloric materials in the mid-term. Regarding this new line of research, I have been recently awarded a Consolidación Investigadora 2023 project (194.6 k€), focused on multicaloric effects in ferroelectric oxides under strain, that I will start soon at INMA (April 2024).

**Resumen del Currículum Vitae:**

Throughout my scientific career, I have authored 38 publications (21 Q1, 561 citations and h-index = 16 -100 citations/year in the last year-, WoS) in highly recognized journals (e.g. Phys. Rev. B, Phys. Rev. Lett., Nanoscale or Inorg. Chem) of which 12(6) as 1st(2nd) author and 7 as CA. I have participated in 12 research projects (2 European including 1 as PI, 5 national of which 1 as PI & 5 regional) and in >25 synchrotron peer-reviewed projects (7 as PI) at several facilities (ESRF, ALBA, BESSY II, DIAMOND, SLS, SOLEIL and Elettra). I have also secured competitive grants for self-financing: 1 predoctoral (Diputación General de Aragón) and 2 postdoctoral (Juan de la Cierva-Incorporación, declined in favour of MSCA IF, and internal grant by CSIC "Extensión de proyectos MSCA IF-ERC"). In addition to 41 contributions in 12 international and 7 national conferences (16 talks of which 4 invited/keynote and 9 posters as CA), I have delivered 8 invited seminars (2 international) and been part of the organizing committee of 5 international scientific events. I have supervised 3 MSc thesis & 1 BSc project, imparted lectures in specialized schools and I am teaching collaborator at the Condensed Matter Physics Department (Universidad de Zaragoza). Moreover, I am engaged in science communication & outreach activities: media interview (Heraldo de Aragón), Twitter (@EagerMSCA), European Researchers' Night, International Day of Women and Girls in Science (11F), etc. I have also received the "Certificación I3" by Ministerio de Universidades, Spain (call 2021).

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | FRAIRE , JUAN CARLOS |
| **Referencia:** | RYC2023-043053-I |
| **Correo Electrónico:** | jfraire@ibecbarcelona.eu |
| **Título:** | Nanomotor-based gene and light therapies |

**Resumen de la Memoria:**

During my scientific career, I acquired a multidisciplinary set of skills that range from nanoparticle (NP) synthesis and the study of their optical properties to the use of advanced light-triggered effects and the design of nanocarriers. My research interests brought me to the exciting field of advanced drug delivery, particularly on the delivery of nucleic acids, and during the last 2 and a half years I immersed myself in the emerging field of self-propelling NPs (nanomotors or nanobots) to explore their synergy with gene and light therapies. In that sense, my background covers a wide range of synthetic methods for nanoformulations but also in cell experiments for delivery studies including cell culturing, flow cytometry, advance microcopy techniques (confocal microscopy / FCS), cell viability and transfection yield quantifications.

My publication record demonstrates my long-term expertise on the synthesis/use of both, metallic and polymeric NPs, to design nanocarriers for nucleic acid delivery. In the same way, I have demonstrated experience on the use of light-responsive materials for trespassing of biological barriers (from protein aggregates and biofilms to the extracellular and the endosomal membranes). This set of skills, in combination with the acquired experience in the study of nanomotors, will allow me to design advanced therapeutic strategies with particular emphasis on bladder cancer (BC). In that sense, my main research lines will focus on the use of urease-powered nanobots for: 1) nanomotor-based delivery of therapeutic siRNAs, and 2) nanomotor-based immunotherapy based on laser-triggered photo-mechanical effects.

The host group is well-recognized in the nanomotors community for leading the development of enzymatic nanobots for biomedical purposes, studying them both at the fundamental and applicative level for the delivery of small molecule therapeutics. My current research lines are independent but complementary to the research interests of the host group, and it is the fruit of the knowledge acquired through research and leadership on projects in the field of advanced drug delivery of nucleic acid therapeutics, the study and application of the optical properties of light responsive nanoparticles, and the collective displacement capabilities of nanomotors. The development of these strategies would imply a big leap in the drug delivery field and could give the basis for novel immunotherapies for BC. My unique combination of expertise obtained through work experience makes me a valuable interdisciplinary researcher, which will open the path to these new research lines focused on the development of nanomotor-based gene and light therapies.

**Resumen del Currículum Vitae:**

In my PhD, I studied the generation of plasmonic nanostructures that can be applied in ultrasensitive spectroscopy. Towards the end I had the chance to work at Boston University in Prof. Bjorn Reinhards group, where I became acquainted with the application of nanoparticles to cells. This experience raised my interest in the nanomedicine field, and in 2016, I moved to Belgium to work under the supervision of Prof. Stefaan De Smedt and Prof. Kevin Braeckmans. During this period as a postdoc, I submerged myself into drug delivery techniques and cell transfections, applying my expertise in nanoparticle synthesis and functionalization to challenging drug delivery questions. My research was centered around the photoporation concept, which allows to transiently permeabilize the cell membrane through a combination of laser light and photothermal nanoparticles. My contributions resulted in several high-impact publications as a main collaborator (Nat. Comm., Nat. Nanotech., ACS Nano, etc.) and two first-author publications. During this period, I became co-promotor of two PhD theses focused on the design and optimization of nanocarriers for diabetic wound healing applications. My senior role was reflected in my appearance as last author in six publications in A1 journals. The immersion into the drug delivery field encouraged me to apply to the prestigious FWO fellowship. In this project I designed a new kind of engineered nanomaterial that can be used for creating larger pores in cell membranes (Nat. Comm, 2022). The novelty of the concept, with clinical cell engineering potential, motivated me to guide the exploration of its capabilities for the generation of cell-based therapies. For this I became co-promotor of a PhD thesis centered in the generation and evaluation of chimeric antigen receptor (CAR)-modified NK cells to be defended in 2024. In 2021, I successfully applied to a FWO stay abroad grant to become a visiting postdoctoral researcher at Prof. Samuel Sanchez's group in IBEC (Spain) to explore the synergy between nanomotors, photoporation and nanocarriers. The aim of such collaboration relies on performing proof-of-concept studies on enzyme-powered self-propelling photothermal particles and nanocarriers, combining the strengths of both systems towards clinical applications. My successful insertion into the nanomotors field gave rise to a work as first author (ACS Nano, 2023). Additionally, I got involved in the several research lines in Prof. Sanchez's group, making substantial contributions on the design and implementation of drug-loaded nanomotors. I am currently exploring the synergy of nanocarriers and nanomotors as a Marie-Curie COFUND postdoc fellow (2022-2025, Beatriu de Pinós). Since July of 2023 I have been promoted to Senior Researcher at IBEC, where I lead the projects related to the application of nanomotors in gene and light therapies at the Smart Nano-Bio-Devices group. I am currently the principal co-promotor of a PhD thesis developing nanomotor-based gene therapy for bladder cancer.

Scientific production: I am currently a coauthor of 49 peer review scientific publications with 1377 citations, with h-index of 21 and filled 3 patents.

Besides my scientific activities, I am currently invited lecturer at the Master course: Bionanotechnology, School of Chemistry, Ghent University, Belgium.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | VIDAL PEÑA, FERNANDO |
| **Referencia:** | RYC2023-045055-I |
| **Correo Electrónico:** | fernando.vidal@polymat.eu |
| **Título:** | Controlled Polymerization Catalysis for Advanced Materials in Sustainable Additive Manufacturing |

**Resumen de la Memoria:**

Dr. Vidal's scientific career extends at the interphase between inorganic, organometallic, polymer chemistry and soft materials, with a broad expertise in polymerization catalysis, as well as in the development of advanced polymeric materials. He has gained ample experience in several controlled metal-based catalytic polymerization methods of great utility, including Coordination-Addition Polymerization of vinyl monomers, Ring-Opening Metathesis Polymerization (ROMP) of norbornenes, Ring-Opening Polymerization (ROP) of cyclic lactones, and Ring-Opening Co-Polymerization (ROCOP) of cyclic anhydrides/epoxides/CO2. He is also an expert in some of the most important characterization techniques in polymer science (Differential Scanning Calorimetry, Thermalgravimetric Analysis, Dynamic Mechanical Analysis, Gel Permeation Chromatography, tensile-testing, and melt rheology).

Dr. Vidal commenced his research practice in inorganic and organometallic chemistry as an undergraduate and masters' student at the University of Almería (Bs. 2011) and University of Alcalá (Ms. 2012) (Spain), respectively. During his graduate studies at Colorado State University (PhD 2017) (USA), Dr. Vidal concentrated his efforts in solving the stereoregular and living polymerization of challenging multifunctional monomers (either containing 2 C=C, such as divinyl methacrylates, or 2 ester groups, such as bio-based itaconates) using chiral cationic metallocenium catalysts. Going beyond these catalytic and mechanistic studies, he exploited their precise stereoregularity and additional chemical functionality to obtain unprecedented crosslinked stereocomplexes and toughened thermoplastic elastomers.

Acknowledging the problems derived from the excessive usage of plastics and their polluting risk for the environment, his postdoctoral appointments have given Dr. Vidal the opportunity to veer his research goals towards important sustainable targets. At Rutgers University-Newark (USA, 2017-2020), he exploited for the first time "classical" Lewis pairs as supramolecular interactions in transient polymer networks. This strategy can help extend the life of important engineering materials, such as vulcanized rubbers, by autonomous self-healing or temperature-induced melt-reprocessing. He also devised new polymer-bound Lewis acidic organocatalysts, a promising "green" venue for implementation of recycling or continuous-flow methods. At the University of Oxford (UK, 2020-onwards), Dr. Vidal targeted high performing and degradable polymers from industrial waste streams (CO2/SO2 and epoxides), as well as developing new boron-based polyesters. He was an active collaborator in the interdisciplinary "Future of Plastics Programme" network with economists, international law scholars, and environmental engineers, at the Oxford Martin School to devise a roadmap towards a circular economy for plastics.

His future research interests are geared towards applying new catalytic methods to obtain functional polymers for sustainable applications, with a particular emphasis on additive manufacturing, and understanding their end-of-life fate, including chemical recycling and (bio)degradation studies.

**Resumen del Currículum Vitae:**

Since May 2023, Dr. Fernando Vidal is a senior research associate (PDRA) at POLYMAT in Spain. There, he is launching a new research line in sustainable additive manufacturing, while directing a PhD student and MSc. Student. He obtained a Bachelor's Degree in Chemistry at the University of Almería (2011) and a Master's Degree in Organometallic Chemistry at the University of Alcalá (2012). During this period, he conducted research in the groups of Prof. Manuel Fernández-Pérez (>12 months), and Prof. Pilar Gómez-Sal and Prof. Marta E. G. Mosquera (~7 months). He completed his academic training at Colorado State University (USA) in the group of Prof. Eugene Y.-X. Chen, where he graduated with a PhD in chemistry in 2017. He then undertook a 3-year postdoctoral stint in the group of Prof. Frieder Jäkle at Rutgers University-Newark (USA). There, he coordinated and managed the PolyRUN laboratory, a state-of-the-art facility for the characterization of soft materials. In October 2020, Dr. Vidal moved to the University of Oxford in the UK where he joined the group of Prof. Charlotte K. Williams first as a Newton International Fellow and later as a Marie Skłodowska-Curie Individual Fellow. At the same time, he was a leading PDRA in chemistry of the "Future of Plastics Programme" at the Oxford Martin School to develop a roadmap for a new sustainable circular plastic economy.

Dr. Vidal's career is defined by his extensive international experience (>10 years), as well as the attainment of very prestigious and competitive grants, including the Fulbright Scholarship ("Ampliación de estudios", 2012), the Newton International Fellowship (2020), and the Marie Skłodowska-Curie Individual Fellowship (2021). These programmes added to aprox. 423K € in research funds. He has received 3 other Spanish and UK national research grants, and 6 presentation and travel awards. His has also collaborated in securing >$300k in funding through various USA national grant applications (NSF and the SEED Grant Program). Dr. Vidal has currently submitted a ERC-Starting Grant (101164907_CAMPO) as principal investigator (PI), which is currently under evaluation. He is also a work package leading team member of the European POLINA Pathfinder project (400 k€), and European Consortium IMPOWER (not awarded).

He has published 18 peer-reviewed papers, of which 12 are as first-author and 2 as corresponding author (in Chem. and J. Am. Chem. Soc.; h-index 10, >540 citations in Google Scholar), one first-author in Nature, five first-author in J. Am. Chem. Soc., one first-author in Angew. Chem. Int. Ed.. He is also presented his results in oral and poster presentations in 10 international and national congresses and symposia in the USA and Spain. For these contributions, he has received 4 travel awards and 3 best poster presentation awards. He has given 5 invited talks to audiences in various fields and backgrounds, including law and policy makers, researchers, and industry.

He has trained 10 students (3 undergraduate, 3 Masters, 4 PhD) for over 4 years of laboratory supervision. As such, he has directed two Masters thesis dissertations (University of Oxford). In addition, he has been an invited lecturer at Rutgers University and a laboratory teaching assistant (10 h/week, 5 months) in the General Chemistry Laboratory I (CHEM 112) at CSU. He is also participated in outreach activities to engage high school students and the broader public through his blog posts and media.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | PORRO AZPIAZU, JOSE Mª |
| **Referencia:** | RYC2023-044841-I |
| **Correo Electrónico:** | jm.porro@bcmaterials.net |
| **Título:** | Trayectoria investigadora de Jose M. Porro |

**Resumen de la Memoria:**

I got my PhD in Physics from the University of the Basque Country in February 2014. The research for my PhD was done at the nanomagnetism group of CIC nanoGUNE (San Sebastián, Spain), under the supervision of Prof. Paolo Vavassori, thanks to a PhD fellowship that I obtained from the Department of Education of the Basque Government. My contribution to the group was to study different nanostructured materials in which magnetic dipolar interactions were tuned to obtain specific behaviors. These nanostructures included asymmetrically coupled elongated nanomagnets in which highly energetic non-uniform magnetic states were induced; the obtention of long-range ground state ordering in square artificial spin-ices through thermalization processes; and the ultrafast propagation of domain walls in planar nanoconduits.

After my PhD, in April 2014 I joined the ISIS neutron and muon source of the Rutherford Appleton Laboratory (Oxfordshire, UK), as a post-doctoral research associate working in the group of Prof. Sean Langridge, until September 2017. There I acquired experience in neutron scattering experiments, and participated in a project from the Engineering and Physical Sciences Research Council (EPSRC) of the UK, devoted to the study of magnetization dynamics of Artificial Spin Ices. I was responsible of the synchrotron radiation beamtimes. I managed to obtain beamtime at different synchrotrons, such as Diamond (UK), ALS (Berkeley, USA), NSLS-II (Brookhaven, USA) and SOLEIL (Paris, France). During my PDRA I was also a visiting scientist at the I10 beamline of the Diamond Light Source, led by Dr. Paul Steadman, where I was responsible for setting up a new measurement technique, magnetic x-ray photon correlation spectroscopy.

In October 2017 I joined BCMaterials (Bilbao, Spain) as a Marie Curie fellow, after obtaining a prestigious 2-year Marie Sklodowska-Curie Individual Fellowship, with the objective of bringing my expertise in synchrotron and neutron radiation experiments to study magnetic materials at BCMaterials. The MSCA-IF allowed me to start establishing my own research group in magnetism at BCMaterials, while starting to supervise TFGs (final degree projects) and TFMs (master thesis).

When I finished my MSCA-IF, I obtained an Ikerbasque Research Fellowship to consolidate myself at BCMaterials. I continued leading my own research group in magnetism, starting with the supervision of PhD and Master students. In 2022 BCMaterials created a new research line on Neutron Sciences, of which I am the co-leader. Both my group in magnetism and the neutron science research line are formed by researchers funded by public competitive funding calls. The magnetism group is composed of 5 PhD students, whereas the neutron science research line is composed of 4 postdocs and 8 predocs, as well as two master students. I have established long-term international collaborations with neutron sources around the globe, including the ILL (France), ISIS (UK), Budapest Neutron Centre (Hungary), the Swiss Neutron Source of the PSI (Switzerland) and ANSTO (Australia). I am also responsible of hosting PhD and postdoc researchers from international institutions at BCMaterials. Since 2020, I am a lecturer in the Master in New Materials of the University of the Basque Country and of the University of Cantabria, teaching the course "synthesis and processing of new materials".

**Resumen del Currículum Vitae:**

Dr. Jose María Porro is currently an Ikerbasque Research Fellow and co-leader of the neutron science research line at BCMaterials (Bilbao, Spain). He obtained his PhD in Physics-Materials Science in 2014, from the University of the Basque Country, doing his PhD research at the nanomagnetism group of CIC nanoGUNE (San Sebastián, Spain), under the supervision of Prof. Paolo Vavassori. After his PhD, he held a post-doctoral research associate position at the ISIS neutron and muon source of the Rutherford Appleton Laboratory (Oxfordshire, UK) until September 2017. At the same time, he was a visiting scientist at the I10 beamline of the Diamond synchrotron (UK). In 2017 he secured a MSCA-IF to continue his research career at BCMaterials, followed by an Ikerbasque Fellowship in late 2019 at the same institution.

His expertise focalizes in the investigation of magnetic materials, including magnetic shape memory alloys and in thin film and interacting nanostructures' magnetism. His research interests also include the characterization of the aforementioned materials by means of large-scale facilities such as synchrotron and neutron radiation sources. His current research activities include the study of ferromagnetic shape memory alloys undergoing patterning, the study of all-optical switching phenomena in magnetic multi-layered thin films, the study of a novel class of interacting magnetic materials called Artificial Spin-Ices, and magnetic materials for spintronic applications.

He has secured funding for this research activities as PI from European (Horizon Europe & Horizon 2020), national (Proyectos Generación Conocimiento) & regional (IKUR, PIBA) funding schemes, with over 1M€ funding obtained. He is author and co-author of over 35 research articles published in indexed journals, most of them being in the first quartile (Q1), with an h-index of 14. He contributed to the organization of international and national conferences and workshops, participating as member of the Program Committee of the Magnetism and Magnetic Materials conferences (over 2000 delegates) and international workshops. He has delivered over 10 invited talks in the last 4 years, including one Gordon Research Conference in Neutron Scattering. He is currently member of the Board Directors of the Spanish Society of Neutron Techniques since 2022, member of the Magnetic Materials Committee of the TMS of the USA, and was a member of the user committee of the IBR-2 neutron source (Dubna, Russia) until 2022. He is an Editorial Board Member of the journal Magnetochemistry. He is an evaluator for the Spanish "Agencia Estatal de Investigación" on "Generación de conocimento" project calls, as well as a scientific expert (evaluator of neutron beamtime proposals) in the panel "Nanosystems and soft matter" for the IBR-2 neutron source (until 2022), as well as for the Australian Centre for Neutron Scattering (ACNS, ANSTO) and for the ILL (France). He is an active reviewer for Physical Review Letters, Physical Review B, Applied Physics Letters and Journal of Applied Physics, among others. He is a lecturer of the Master in New Materials of the University of the Basque Country and the University of Cantabria. He has supervised six Master Thesis and two TFGs (final degree projects), as well as several short research internships, and currently supervises five PhD students and one Master Thesis.

**Resumen de la Memoria:**

I am a multidisciplinary tissue-engineering scientist specialized in carbon nanomaterials. Briefly, I have large experience in all the fields for the development of carbon-based scaffolds for electroactive tissue regeneration, including computational chemistry, nanomaterials, polymer science, organic chemistry, electrochemistry, and molecular and experimental biology.

During my PhD, I combined computation and experimental work in collaboration with leading scientists in the field of fullerenes. We defined the rules of formation of fullerenes, published in the highly reputed journal, I synthesized novel functionalized fullerenes and become an expert of the reactivity of fullerenes.

In 2015, I moved to the University of Trieste (Italy) to work with Prof. Prato as a post-doctoral researcher. In 2016, I transferred to his second laboratory at CIC BiomaGune in San Sebastian. The core of this research line is a chemical synthetic effort to prepare revolutionary bio-hybrid 3D constructs composed of carbon nanotubes (CNT) for nerve and cardiac tissue engineering. Conjugated polymers were used to maintain the tridimensional structure and obtain self-standing blocks. To manufacture them, both chemical and electrochemical polymerization techniques were employed. The resulting devices were very promising, with very low density, good porosity and high conductivity that fulfill all the biocompatibility requirements for further application in tissue regeneration. In 2016 I became the leading researcher and coordinator of this research line within Prato's group, including the supervision of 6 PhD students and 3 post-docs; currently, I still am. I am currently developing a business and strategic plan to create a start-up company from the successful results and scaffolds obtained so far.

My ultimate goal is to implant our scaffolds in diseased parts of our body (nervous system, heart) to restore lost functionalities or take care of the enduring tissues. For that, my next ambition was to acquire the biomedical and cell biology skills to study the effect in vitro and in vivo of my scaffolds. Thus, in 2018, I obtained a Marie Curie Grant, with the aim of treating heart diseases through tissue engineering with my devices, and provide novel tools for innovative therapeutic devices. I joined Prof. Mestroni's group (University of Colorado Denver, USA) where I grew primary cardiac cells inside my CNT 3D scaffolds to obtain self-beating devices with high potential to repair damaged heart tissue and eventually create "artificial hearts". In my returning stage (2020), I moved to Prof. Mecerreye's lab at Polymat (San Sebastián) to develop new conductive printable hydrogels and obtain innovative structure to fulfill our purpose, while I perform the biological related studies in Biodonostia HRI.

Currently, I continue my research related to the development of 3D scaffolds composed of CNT at CIC BiomaGUNE and their biological application for neural and cardiac tissue regeneration at Biogipuzkoa, where I stablished a novel field cardio-nanoscience research line. Recently, I obtained an Ikerbasque position and will officially join Biogipuzkoa in few months as co-leader of the cardiology group, together with the clinician Xabier Arana (head of the Cardiology Department of the Donostia Hospital), to launch a renewed clinical and research laboratory.

**Resumen del Currículum Vitae:**

I have performed my PhD with Prof. Poblet at the University Rovira I Virgili (Tarragona) in Computational and Experimental Chemistry of Fullerenes. My thesis (2014), titled "Computations on Fullerenes: Finding Rules, Identifying Products and Disclosing Reaction Paths", was awarded with the excellence recognition and ended with 12 publications. Most of my projects have been developed in collaboration with the leading scientists in the field of fullerenes, as Prof. Echegoyen and Prof. Balch. During that period, I studied a second MS on Bionanotechnology, from which I was also awarded the excellence recognition.

In 2015, I moved to the Univeristy of Trieste (Italy) to work with Prof. Prato as a post-doctoral researcher. In 2016, I was transferred to the second laboratory of Prof. Prato in CIC BiomaGune (San Sebastian). My research during these years focused on the design and synthesis of CNT-based 3D scaffolds for nerve tissue engineering.

In 2018, I was awarded a Global Marie Curie Fellowship between Polymat and the University of Colorado Denver (USA), to further expand my research and skills in cardiac cell biology and biomedicine. Thus, I moved to Prof. Mestroni group at the Cardiology Department, where I performed in vitro studies growing cardiac cells inside the 3D scaffolds manufactured to obtain self-beating devices with high potential to repair damaged heart tissue and eventually create "artificial hearts". In 2020, I moved to Prof. Mecerreyes laboratory (UPV/EHU, San Sebastian) to developed novel conductive hydrogels. Since my return, I am a recurrent visiting researcher in Biodonostia HRI for the cell biology studies of my project, i.e., in vitro studies to test the new scaffolds I am producing, bring all the knowledge acquired, expand my knowledge in cardiac muscular dystrophies and stablish a new field of cardionanoscience.

In 2021, I rejoined Prof. Prato at CIC BiomaGUNE, where I am developing new hydrogels and scaffolds for neuron and cardiac regeneration, testing the materials in vivo in spinal cord injury rat models and promoting the transferability of the successful results into the formation of a new spin-off company. In addition, last year I obtained an Ikerbasque position at Biogipuzkoa, from where I will continue my research with neuronal and cardiac regeneration as co-leader of the Cardiology Group.

I have already produced exceptional outputs and demonstrated a significant level of scientific maturity. Among my successes, it is highlighting:

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- Articles: 38 papers and 4 book chapters. In 70% of my publications, I is first (15), second (6), last (4) and/or or corresponding author (14). I participated in 17 congresses, being invited speaker in 7 of them.
- Funding from 8 national projects (total = 913.4k€)
- Academically, I has been in charge of three subjects of the last courses of the BS in Chemistry during my PhD.
- Mentorship: 3 undergraduate students, 3MS, 6 PhD, and 3 postdoc.
- Dissemination: coordinator of the Pint of Science Donostia since 2022; invited in a round table for the "Emakumeak Zientzian 2023"; 7 scientific for kids (Denver, 2018; Donostia 2017, 2019, 2021, 2022;Tarragona 2019; Urnieta 2022); invited talk about Nanoscience during the "Donostia WeekINN" (2019); made 2 documentaries for the TV program "Teknopolis" in EITB (emission in 2017 and 2022); has been interviewed from Elhuyar.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | STERN TAULATS, ENRIC |
| **Referencia:** | RYC2023-043444-I |
| **Correo Electrónico:** | enricstern@gmail.com |
| **Título:** | Caloric effects for solid-state cooling |

**Resumen de la Memoria:**

According to WoS database (1/2024), I have published 26 papers in peer-reviewed scientific journals, 7 as 1st author (27%) and 11 as 2nd author (42%), and 1 as last author (4%). My H index is 21. My papers have been cited 1781 times, with an average rate of 69 citations per article, and 148 citations per year. Since the start of my postdoctoral career (2017), the average Nº of citations per year has risen to 216. 17 of my research papers (65%) have been published in the high-impact first quartile (Q1) journals, including 2 Nature Comm., 2 Adv. Mater., 1 Appl. Mater. Today, 1 Acta Mater., 1 MRS Bull., 1 APL Mater, and 2 PRB. 5 papers (19%) are positioned in first decile (D1) journals. The overall citation percentile median of my published papers is 91%.

**Resumen del Currículum Vitae:**

My research focuses on phase transitions displaying coupling between different degrees of freedom. My interest lies in the giant caloric effects that can arise under these conditions, and their exploitation in more sustainable cooling and heating technologies. To achieve this, I design advanced caloric materials, develop cutting-edge experimental techniques, and transfer technology into operating devices.

My PhD in Nanoscience was held at the UB and funded by the APIF 2012 (UB) and the FI-DGR 2013 (AGAUR Catalonia) predoctoral scholarships. During my PhD, I was a visiting researcher at IACS (Kolkata, India. 2/2014), Northeastern University (Boston, USA. 3/2015), and University of Cambridge (UK. 9/2015-12/2015, funded by the merit-based Fundació Montcelimar mobility grant). My PhD dissertation was awarded a "Cum Laude" distinction (4/2017), the UB Extraordinary Doctoral Prize, and was qualified with European Honours.

In the 5+ years period (4/2017-5/2022), I was a postdoctoral researcher at Cambridge University (CU) in Dr. Xavier Moya᾽s group, during which I was funded by a Royal Society Newton International Fellowship (4-2018/3-2020) and was Research Associate at Darwin College. In CU, I searched new families of colossal barocaloric materials and, in parallel, I started new lines of research on the finding of novel cooling physical mechanisms based on the sorption of gases (patent filed on 30-9-2022, PCT/EP2022/077404). I gained expertise in heat transfer phenomena, pressure transmission techniques and finite element methods for the simulation of physical phenomena. I enrolled in R&D projects aimed at developing applications for these effects (see section C.4). I collaborated closely with tech-transfer consultants (TTP consulting, Blue Lightning Solutions, and Duras Consulting) and industrial partners, mainly Cambridge Refrigeration Technology and the global domestic appliance brand BEKO Ltd, whose central headquarters in Istanbul (Turkey) were visited to engage in scientific workshops. This experience was highly beneficial for my role as a scientific advisor at the startup Barocal Ltd for the pioneer development of barocaloric cooling technologies since its foundation at CU (5/2019). My contributions led to the first-ever barocaloric cooling prototype, which was selected as one of the top eight 2020 Global Cooling Prize finalists with over 2100 participants.

I joined the Functional Materials and Phase Transitions group at the UB in May 2022 with a Juan de la Cierva-Incorporación Fellowship, where I am contributing to the understanding of multicaloric effects in a wide range of materials. My incorporation as a tech-transfer expert was crucial in launching the development of cooling prototypes for the first time ever in the group. I have established new strategic collaborations with J.F. Capsal and G. Sebald (LGEF group. INSA-Lyon, France), and since 9/2022, I have been co-supervising the PhD student Aleix Abadia-Huguet.

I am PI for the awarded beamtime project at Alba synchrotron (BL11 - NCD-SWEET). Other cutting-edge research facilities for awarded proposals in which I have been co-investigator include the I15 (Diamond, UK) and the BL04 (ALBA, Spain) synchrotron beamlines to perform XRD under electric field and pressure for caloric materials characterisation, and at the D1B neutron diffractometer in ILL (France).

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | BLANCO , MARIA VALERIA |
| **Referencia:** | RYC2023-045836-I |
| **Correo Electrónico:** | mariavaleriablanco@gmail.com |
| **Título:** | study of structure-performance interplay in energy-related materials |

**Resumen de la Memoria:**

I am a Material Science researcher leading two research lines on the study of structure-property interplay in energy-related materials by advanced characterization techniques.

I obtained my PhD in Engineering Sciences (2015, Argentina) working on the development of AB5 hydrogen storage materials. I gained expertise in materials synthesis, their chemical, structural and thermodynamic characterization, and their application in industrial prototypes. I published 6 works in peer-reviewed journals and 11 Technical Reports on the successful implementation of such materials to into schemes of hydrogen separation from gas mixtures generated by a local industry.

In 2016 I joined the ESRF (France) as a Postdoctoral Scientist. I consolidated two research lines involving in-situ X-ray diffraction studies of materials for: (i) CO2 capture and (ii) Lithium-ion batteries. Within my inhouse projects, I initiated and led international collaborations, which are reflected in the supervision of graduate students and in the publication of research articles as last/ corresponding author in relevant journals, such as J. Chem. Eng. (IF=16.7). Also, I established collaborations with external researchers which resulted in publications in high impact factor journals, such as ACS Energy Lett. (IF=22), J. Am. Chem. Soc. (IF=15) and J. Power Sources (IF=9.2).

In 2018, I deepened my research in Li-ion Batteries by joining the NTNU (Norway) as a Postdoc. Here, I worked with the development of Si-based anodes. I applied multiple characterization techniques for optimizing the design of negative electrodes, and I built collaborations with industries to develop scalable procedures to design improved anodes. I co-supervised 1 undergraduate student and 1 Master student and published 3 scientific papers as corresponding author.

In 2021 I was awarded a research project as Principal Investigator (PI) for 810,000 EUR. The project, entitled "Exploiting the Full Potential of Silica Anodes for Li-ion Batteries", was funded by the Norwegian Research Council under the call "Groundbreaking Research Project for Young Talents". This allowed me to lead my research team at NTNU as Adj. Assoc. Professor. I was invited speaker in 3 international conferences, I am Main Supervisor of a PhD student, I directed 2 Master projects, I was Main Proposer of 2 beamtimes and I published an article in Sci. Rep. as last and corresponding author.

In 2021 I built an international consortium composed by academic and industrial partners and submitted an innovative research proposal for the scaling up high-performance anodes for Lithium-ion batteries, while performing advanced characterization. The research project I conceived and wrote was funded for 1.26 MEUR by the M-ERA.NET European call. I am Principal Investigator (PI), Coordinator of the International Consortium, contract supervisor of 1 Postdoctoral Fellow and Main Supervisor of 4 Master students and I organized international workshops on the project topic. So far, project activities resulted in 6 contributions to conferences and 3 submitted manuscripts.

In 2022 I obtained a Maria Zambrano Grant for the Attraction of International Talents through a competitive call to join University of Zaragoza. In the framework of this grant, I lead a research line in the study of the structure-performance interplay of materials for energy applications.

**Resumen del Currículum Vitae:**

I am an Environmental Chemist, graduated from National University of La Plata (2010, Argentina). I carried out my PhD in Engineering Sciences (2015, Argentina) in the development of hydrogen storage materials. In here, I worked in the synthesis and conditioning of AB5 alloys and their implementation to absorb hydrogen from a gas mixture generated by a local industry.

After completing my PhD (2015), I joined the ESRF (France), as a postdoctoral scientist. During this period, I consolidated two new inhouse research lines, one on CO2 capture materials and one on Lithium-ion batteries, and I established collaborations with international researchers (ETH, LEPMI Lab) and I supervised three students on my own in-house research topics. Results from my work are reflected in publications in high-impact factor journals, including J. Chem. Eng (IF=16.7), ACS Energy Lett. (IF=22), J. Am. Chem. Soc. (IF=15), J. Power Sources (IF=9.2).

In 2018, I joined NTNU (Norway) as a Postdoc to continue my studies in the field of Li-ion batteries. Here, I achieved significant improvements on the development on next-generation silica anodes for Li-ion batteries, and I built important collaborations with 2 industries for the development of scalable and sustainable procedures for electrode conditioning.

In 2021 I was awarded a project "Research Project for Young Talents" as Principal Investigator for an amount of 800,000 EUR. This has allowed me to initiate my own research group as Adj. Assoc. Professor. I am Main Supervisor of a PhD student, Co-supervisor of a PhD student, I have directed 2 Master Projects and I secured 2 beamtimes as Main Proposer. I was invited speaker in 3 international conferences, I published one research article as last and corresponding author and produced 3 articles than are now under revision.

Due to my deep interest in applied research and advanced characterization, I conceived an international research project and gathered academic and industrial partners for the scaling up of SiOx anodes for Lithium-ion batteries. In this project, the industries oversee scaling up the negative electrodes while the academic partners provide a multiscale-multiprobe characterization of the anodes to improve their design. This project got funding for 1.26 MEUR through the M-ERA.NET European call. In this project I act as PI and coordinator of the international consortium.

2022 I obtained a Maria Zambrano Spanish National Grant for the Attraction of International Talents, to join University of Zaragoza and further advance with the study of energy materials using advanced characterization techniques.

I am the author of 31 scientific publications, Main Supervisor of 1 PhD student, 1 Postdoctoral Fellow and 6 Master students, and Thesis Co-Director of 1 PhD student. I secured funding for >2 MEUR as Principal Investigator in National and European Calls, within which I collaborate with academic and industrial partners. Also, I secured more than 15 beamtimes at DESY and ESRF as Main Proposer through standard calls for proposals, and I was invited speaker in 5 international conferences. I have reviewed more than 20 articles in scientific journals and joined committees for the recruitment of research fellows. My research excellence and maturity level are also reflected in my recent ERC Starting-Grant Proposal (2022), which passed to stage two (Panel PE11).

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| **Área Temática:** | Ciencias y tecnologías de materiales |
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| **Referencia:** | RYC2023-043157-I |
| **Correo Electrónico:** | jpellico@hotmail.com |
| **Título:** | Single particle real-time tracking with positrons in cardiovascular diseases |

**Resumen de la Memoria:**

My research is chiefly focused on the development of advanced functional materials for imaging and therapy. This encompasses a wide range of chemistries, ranging from inorganic and organic synthesis of small molecules and materials to chemistry with radiometals with the ultimate goal of creating a new generation of smart imaging and therapeutic agents. Among the plethora of possibilities, I find the combination of nanomaterials and radiochemistry particularly alluring for several reasons. The disciplines synergise well, leading to an improved response when they are combined. In the past years, I have exploited that combination to create a novel library of radiolabelled nanoparticles for multimodal molecular imaging applications mainly in oncology and cardiovascular diseases. In this regard, I patented a pioneering method for the production of iron oxide nanoparticles doped with different radiometals for PET/(T1)MRI applications from which I received the European Society of Molecular Imaging Excellent Award for Young Researchers. This approach exploits the interaction between non-radioactive and radioactive metals to form inorganic crystal structures able to provide unprecedented stability to the radiometals within the nanoparticle core. Thereafter, we employed this method for the detection of overexpressed angiogenesis in tumours , upregulation of neutrophils in lung inflammation  or phospholipids accumulation in atherosclerosis . More recently, we applied similar approaches for the longitudinal characterisation of calcifications in atherosclerosis  and thrombi after myocardial infarction . These are some examples in which we developed novel in vivo imaging tools to diagnose highly complex pathologies by combination of advanced inorganic materials and modern bioconjugate techniques that ultimately provide a bio-response specifically related to the progression of the disease. I am generally more interested in the production of inorganic nanoparticles such as iron oxide, silica, gold or up-converting nanoparticles; although, during the last 2 years, I have also carried out substantial work investigating the synthesis and radiolabelling of organic nanoemulsions to explore their capabilities not only in imaging but also in drug delivery. The application of nanomaterials to unmet biomedical needs, where the chemistry of materials plays a crucial role, has always been my main research interest and it will constitute a significant part of my future research plans. Currently, one of my main interests is to explore nanoparticles for their application in Positron Emission Particle Tracking (PEPT). PEPT is a high-resolution imaging technique that tracks the trajectory of a single radiolabelled particle in 3-D by taking advantage of the knowledge that all the photons originate from the same point. With over 20 years of applications in industry and various research groups attempting to isolate single particle tracers for PEPT applications in biomedicine, I led the team that successfully demonstrated the first proof of concept in animals. The initial results are exceptionally promising and anticipate exciting biomedical applications in the study of the velocity, density, and overall dynamics of blood flow that are currently impossible to investigate by any other imaging modality.

**Resumen del Currículum Vitae:**

From 2012 to 2015, I pursued my PhD at the University Complutense of Madrid. I combined nanotechnology and radiochemistry to develop a new methodology for producing 68Ga or 89Zr core-doped iron oxide nanoparticles. This method was patented in 2014, and I was awarded the EMIM Excellence Award for your researchers in 2015 for its high relevance. Afterwrads, I successfully detected angiogenesis in tumors by PET/(T1)MRI,  lung inflammation by PET,  and atherosclerosis by PET/(T1)MRI , thus shifting my efforts towards disease detection. After obtaining my PhD with "Cum Laude" honours, I worked as a Postdoctoral Research Associate (PDRA) at the advanced imaging unit at the Spanish centre for cardiovascular research (CNIC). There, I developed probes for PET, MRI and Fluorescence imaging, and achieved notable results, such as detecting brain thrombi in mice for the first time using pretargeting molecular imaging,  and vascular calcifications by PET/MRI using a longitudinal approach,  both works featured as issue covers in prestigious journals. As a PDRA at the University of Oxford from July 2018 to July 2019, I focused on developing bio-responsive nanoparticle-based contrast agents for MRI, and successfully developed the first contrast switchable agent responsive to pH environments using a novel methodology based on polymer-silica hybrids.  Since I joined King's College London in 2019, as PDRA in nanotechnology and radiochemistry, I have led a project on developing single particle tracers for particle tracking applications. Despite laboratory shutdowns due to COVID-19, I wrote and published the largest comprehensive review on the radiolabelling materials topic in Chemistry Society Reviews, which has attracted a remarkable number of citations in only two years obtaining the top 5% of highly cited works from the Royal Society of Chemistry Journals certification last year.  Upon resuming laboratory activities, I reported the first use of a routine preclinical PET scanner for positron emission particle tracking (PEPT) applications (J. Pellico et al. Chem. Eng. Sci. 2022) and successfully developed the first example of a single particle-based probe for nuclear imaging and real-time tracking applications (J. Pellico et al. Nature Nanotechnology 2024) recognised with the Best Image of the Year award at the 4th Symposium on Preclinical Nuclear Imaging  and the Research Innovation Award from the Faculty of Life Sciences and Medicine at KCL in 2023. In 2021, I secured the EPSRC Impact Acceleration Accounts (IAA) grant as Co-PI, and in 2022, I obtained two grants from King' s College London as PI. The financial support garnered over the years has empowered me to serve as the main supervisor for two PhD theses, mentor three PhD candidates during their placements at KCL, and guide five undergraduate and five postgraduate students.  T. I have presented numerous oral communications at peer-reviewed international conferences, delivered plenary talks as an invited speaker on five occasions, organised two European conferences, and served as a guest editor for two special issues in Materials and Frontiers in Chemistry, respectively. In recent years, I have contributed as a member of assessment committees for various institutions, including the European Society of Molecular Imaging, the World Molecular Imaging Society, and the Spanish Distributed Biomedical Imaging Network.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | MAIZ SANCHO, JON |
| **Referencia:** | RYC2023-044285-I |
| **Correo Electrónico:** | jon.maizs@ehu.eus |
| **Título:** | Structure and Dynamics of Polar Polymers and Vitrimers-based Materials for Energy: Insights from Neutron Scattering and Dielectrics, and Other Complementary Experimental Methods |

## Resumen de la Memoria:

Throughout my research career, I consistently aligned with the priorities of centers and research groups, emphasizing multidisciplinary efforts and advancements in various research areas. Fundamental scientific and technical research play a crucial role in advancing knowledge, serving as the foundation for innovation. In my scientific journey, I focused on exploring how properties like confinement affects the physical behavior of polymers, investigating crystallization, structure, and dynamics. This led to a deeper understanding of these properties, prompting a shift to diverse applications in thermoelectricity, ferroelectricity, and dielectric capacitors, crucial within the realm of utilizing organic electronics for energy.

The diverse research lines I have pursued are:

1. My focus was on polymer nanostructure fabrication methods and the influence of nanoconfinement on the physical behavior of polymers, specifically crystallization and molecular dynamics. My areas of interest included the creation of customized one-dimensional pores in porous aluminum oxide (AAO) templates with controlled diameter and length. I utilized various characterization techniques, such as thermal analysis, spectroscopy, scattering, and microscopy.

2. I expanded my interests to the application of polymer nanostructures in the field of thermoelectricity. Thermal and electric conductivity are crucial parameters for these applications. In polymers, these parameters are limited; therefore, our role was to enhance these values somehow. Confined polymers offered a wide range of possibilities, as I had studied during my first research line. Various alumina templates were tailored, and the thermal and electrical properties were studied and extracted, revealing interesting and alternative thermoelectric materials.

3. These advancements in thermoelectric materials brought forth an intriguing opportunity for me. Leveraging the experience gained in my recent years, I initiated a project in collaboration with an industrial partner, focusing on ferroelectric and piezoelectric properties for the development of piezoelectric nanogenerators. This collaborative effort provided me with the chance to delve into the creation of innovative functional materials with technological relevance.

4. This experience allows me to start developing my own research line focused on the optimization of flexible polymers for energy harvesting applications. My previous experience in various experimental techniques, such as calorimetry, X-ray scattering, and microscopy, became highly relevant for understanding the structure, morphology, functionality, and different properties of these flexible polymers. Moreover, I have acquired the ability to independently execute multidisciplinary scientific projects.

5. Currently, I am focusing on a new research line that builds upon my previous experiences, aiming to enhance the performance of solid dielectric layers in energy storage capacitor devices. To achieve this, I am utilizing the concept of dipolar glass polymers, copolymers, and vitrimers to innovate in the preparation of new capacitors. During this pursuit, I have recognized that neutron scattering techniques, when combined with other characterization methods such as dielectric spectroscopy and calorimetry, constitute a powerful tool for exploring the impact of various systems on electrical properties.

## Resumen del Currículum Vitae:

I am a Materials Researcher specializing in polymer nanostructure fabrication. I focus on the impact of nanoconfinement on polymer physical behavior, including crystallization and molecular dynamics. My expertise involves creating one-dimensional pores using porous aluminum oxide templates, characterized through thermal analysis, spectroscopy, scattering, and microscopy. I have significantly enhanced our group's capabilities, particularly in the field of energy applications, emphasizing the crucial roles of both structure and dynamics in advancing novel polymer materials.

With a strong research record, I have 42 publications, including 14 as the first author and 10 as the corresponding author. Currently, I focus on neutron science applications, studying materials for energy applications.

I have demonstrated the capacity and knowledge to establish an independent research line by successfully acquiring resources and personnel. Throughout my research career, I actively participated in 18 research projects, making significant contributions, particularly during my postdoctoral years. As a Gipuzkoa Fellow at POLYMAT, I played a key role in securing projects, including a Marie Skłodowska-Curie RISE and the ELKARTEK project funded by the Basque Government. I secured funding as PI from Fundación IBERDROLA's 'Ayudas a la Investigación en Energía y Medio Ambiente' program. From 2019 to 2023, I applied for a total of 6 projects, serving as the PI in 2, and secured a cumulative funding of approximately 1.2 million euros. Noteworthy projects include those within the Basque university system, the 'Programa de Red Guipuzcoana de Ciencia, Tecnología e Innovación' of the Diputación Foral de Gipuzkoa, and the 'Transición Ecológica y Digital' and 'Generación de Conocimiento' projects of the Agencia Estatal de Investigación. I played a significant role in successfully proposing projects at large facilities such as synchrotrons (ESRF and ALBA) and neutron scattering facilities (ILL, PSI, ISIS), serving as the primary or co-proposer and actively participating in conducting experiments.

In recent years, I have successfully supervised 2 master's students and 1 PhD student, who defended their theses with distinction in 2022. Currently, I oversee 2 PhD students, 3 postdoctoral researchers, and 1 master's student with a grant from 'Mujeres por África.' Throughout my career, I established international collaborations with prominent researchers in polymer science. My research impact is recognized through awards, including the International Doctor "Doctor Europeus" in 2013 and the Extraordinary Doctoral Award in 2015 from Universidad del País Vasco. I received an honor for one of my PhD publications, obtaining the Best Scientific Article in Calorimetry and Thermal Analysis in 2013 from GECAT.

Additionally, I served as a Guest Editor for a Special Issue in "Polymers" and actively engage in science communication. I contributed as a speaker at the University of the Basque Country in 2017, sharing my research experience abroad. Involved in various communication activities at CFM, I participated in organizing a significant international conference in 2022 (QENS/WINS) and in 2014 (ECT2014). Furthermore, I fulfill roles as a reviewer for scientific articles in various journals and serve as an evaluator in assessment processes for the Agencia Estatal de Investigación.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | PATIL , NAGARAJ |
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| **Título:** | Investigador Titular |

**Resumen de la Memoria:**

Over 12+ years, my research in Polymer Chemistry and Battery Sciences has led to the development of advanced redox polymers, including poly-catechols, quinones, phenazines, and imides, serving as organic electrodes. Employing macromolecular engineering approaches, we have pushed the boundaries of organic batteries beyond the state-of-the-art in various disruptive battery technologies, including Li-ion, Zn-polymer, and all-polymer configurations.

• Master's thesis at IISER-Kolkata (2011–2012): Synthesized non-linear poly(ethylene glycol) hydrogels, investigated thermoresponsive behavior by Mueller Matrix Polarimetry, and contributed to 2 journal articles.

• During my PhD (2013–2017) at the University of Liege, Belgium, I participated in the Marie-Curie ITN 'RENAISSANCE' and achieved controlled synthesis of catechol-derived polymers by RAFT and CMRP. Applied these polymers in biomedical (antimicrobial coatings), environmental (protein antifouling) and energy storage (organic cathodes in lithium-ion battery). This included contributions to 6 peer-reviewed articles and presentations at 8 conferences.

• PhD research stay (2015–2015) at Linköping University, Sweden, focused on catechol-based redox polymers in electrochemical energy storage, which have been scarcely evaluated in such potential applications. The new and challenging nature of the targeted application allowed me to gain basics of electrochemistry and electrochemical technologies that later helped me extend the scope of polycatechols to energy storage applications, resulting number of key publications in the field.

• As a Postdoctoral Research Assistant at IMDEA Energy Institute, Madrid, Spain (2017–2022), I achieved significant milestones. I received the JDC-Formación fellowship and played a lead role in projects like MATCAP, SUSBAT. My contributions involved synthesizing redox-active polymers for diverse energy storage technologies, such as lithium-ion, zinc-metal, all-polymer static batteries, using redox-active polymers, resulting in 14 peer-reviewed articles, 21 conference presentations, mentoring 2 Master and 5 PhD fellows, and served as an Ad-Hoc Reviewer for 28 publications.

• As a Senior Assistant Researcher at IMDEA Energy Institute in Madrid, Spain (2023–present), I am a beneficiary of the JDC-Incorporación Postdoctoral Fellowship and actively involved in major research projects such as OMBAT and eNargiZinc as Co-PI. My accomplishments include synthesizing redox-active polymers for organic electrodes and redox boosters for batteries, developing various electrochemical energy storage technologies, such as Zn-metal, Al-polymer, aqueous alkaline and acid batteries, mediated-RFB, and FDI. In this position, I have contributed to 7 peer-reviewed journal articles, presented findings at 6 conferences, mentored 1 postdoc and 4 PhD fellows, and serving as an Ad Hoc Reviewer for 14 publications.

Future: As the lead researcher of the polymer battery research line in ECPU, I aim to address energy-water-environment challenges by designing high-performance redox polymers for practical polymer batteries and complementary electrochemical technologies (i.e., FDI, $CO_2$ capture, water splitting). My goal is to achieve sustainable/practical energy storage and integrated/tandem energy generation-storage-water treatment devices, contributing to long-term energy/environmental solutions.

**Resumen del Currículum Vitae:**

I am a Material Chemist with 12+ year scientific experience working in different countries (India, Belgium, Sweden, and Spain) acquainted me research skills in different fields, including polymer synthesis and their applications in biomedical, environment, and energy storage.

Education:

• Awarded integrated MS + PhD fellowship for exceptional BSc performance.

• MS in Chemical Sciences from IISER-K, India, with research on thermoresponsive hydrogels.

• PhD at Liege University, Belgium, under Marie Curie ITN fellowship, focusing on Multifunctional Polyelectrolytes Bearing Pendant Catechol/Quinone for Energy and Environmental Applications.

PhD Research:

• Developed skills in controlled radical polymerization of polycatechols for antifouling coatings.

• Investigated polycatechols as organic electrodes in batteries during a research stay in Linkoping University-Sweden, which have been scarcely evaluated in such potential applications.

• Being a part of Marie Curie ITN program, helped me to establishing research connections in Spain.

Postdoc Research (2018–2022):

• Joined IMDEA Energy as a lead researcher in newly planned polymer battery research line, specializing in Li-ion, aqueous, and all-polymer batteries.

• Established a complementary research line on aqueous Zinc batteries with polymer/inorganic cathodes and concentrated/molecular crowding electrolytes.

• Demonstrated leadership with 14 high-impact scientific works and 21 congress participations.

• Acquired expertise in porous polymer synthesis, electrochemistry, and electrochemical technologies for energy storage.

• Received JDC-Formación (FJC2018-037781-I) and JDC-incorporación (IJC2020-043076-I) grants, showcasing grant-writing abilities.

Senior Assistant Researcher (2023–Present):

• Promoted to senior assistant researcher with the acquisition of JDC-incorporación and OMBAT (PID2021-124974OB-C21) project, in which I am a Co-PI.

• Leading the organic battery research line, supervising PhDs, submitting grants, and expanding research collaborations.

• Demonstrated leadership with 7 high-impact scientific works and 6 congress participations.

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- Extending the scope of redox polymers to complementary electrochemical technologies such as energy generation, faradaic ion capture, and desalination.

Scientific Productivity:

- Published 29 JCR indexed articles (10 invited/themed collection, 14 OA, 94% in Q1, 14 first author, 9 co-corresponding author), cited >1000 times with an H-index of 17, one book chapter, and active participation in national/international conferences.

Participation:

- Active involvement in 11 national/international (1 regional, 4 national, 5 European) research projects, acting as Co-PI for OMBAT and eNargiZinc.
- Regular ad-hoc reviewer for 49 scientific articles, responsible for lab and equipment maintenance.
- Participation in outreach activities and memberships (3) in professional societies.

Supervision:

- Mentored and supervised 1 TFM, 1 TFG, and 1 postdoc 9 PhDs (1 awarded).
- Currently co-directing 3 PhD theses.

Conclusion: Demonstrates leadership qualities, knowledge transferability, and adaptability across diverse research environments.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | MAYORGA BURREZO, PAULA |
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| **Título:** | a constant and coherent light–driven growing, from spectroscopic studies towards the development of photocatalytic materials for biomedical applications |

**Resumen de la Memoria:**

PMB's scientific career could be briefly but accurately described as "a constant and coherent light-driven growing", considering the impact that light, and especially optical properties, have had on it.

PMB's scientific journey starts from fundamental Science, with spectroscopic studies of pi-conjugated molecular materials. Her main contribution to the field revolved around the analysis of different synthetic strategies -based on poly-aromaticity or anti-aromaticity concepts among others- to achieve enhanced pi-conjugated systems. Thus, the knowledge on several characterization techniques (e.g., electronic absorption and Raman spectroscopies, fluorescence, etc.) together with some notions on DFT calculations (i.e., TD-DFT, vibrational spectra, NICS) were acquired and successfully applied as an undergrad/PhD candidate (2010-2015) and improved as junior postdoc (2016) at Malaga University.

During her postdoctoral stay at ICMAB-CSIC (i.e., JdlC-F fellowship (2017-2018) and HECTIC-PTM project -funded by a competitive call (i.e., FUNMAT-FIP-2018) under Severo Ochoa Prog: SEV-2015-0496ó as co-PI (2019-2020)), PMB deepened her expertise in the development of organic-based multifunctional platforms involving stable organic radicals for (spin)electronic applications. Importantly, PMB developed two original research lines around a complementary concept for her CV, such as chirality, and particularly, its combination with optical and transport properties. Her vision and perspectives in the field of functional molecular materials were enlarged while gaining managing as well as technical skills (e.g., EPR, electrochemistry, HPLC, CPL). It is worth mentioning that both lines are very active nowadays at the host institution, involving the work contribution of additional PhD candidates and MSc students.

As senior postdoc -CEITEC-BUT (2020-2021) and UCT-Prague (2021-current)- PMB was devoted to applied inorganic materials. In particular, she mainly contributed to the development of photoactive microrobots for environmental and biomedical challenges. Valuable enhanced designs have already been reported in high impact scientific journals, thanks to the PMB's previous expertise on optical properties.

She is currently a La Caixa Junior leader (ref: LCF/BQ/PI23/11970030) at ICMAB-CSIC, currently heads a new research line devoted to the development of original photocatalytic nanozymes for cancer treatments in collaboration with the Vall d¿Hebron Research Institute (VHIR). In the event of being awarded with a RyC 2023, PMB aims at continuing with her independent research line devoted to the studies on photocatalytic nanozymes and the impact of chirality over ROS-based therapies against cancer.

**Resumen del Currículum Vitae:**

PMB, as a La Caixa Junior leader at ICMAB-CSIC, currently heads a new research line devoted to the development of original photocatalytic nanozymes for cancer treatments in collaboration with the Vall d¿Hebron Research Institute (VHIR).
Her track record so far consists of 40 original research works and 1 minireview have been published in multidisciplinary journals of a broad readership and visualization. In fact, 100% of them appear in the top 25% journals according to CiteScore, with 69.2% of them in the top 25 % most cited documents worldwide. PMB' s authorship position (corresponding (3 %), first (38 %) and second (27.5 %) author) clearly demonstrates the significance of her contributions. With 1139 citations (without self-ones), the excellence of her research can be estimated by a h-index 22 (23 in Google Scholar) and a 63th percentile for Author Impact Beamplot Summary, which is built on a researcher's articles and review documents over their career. Moreover, in terms of Field-Weighted Citation Impact (FWCI), PMB' s work is 1.50, something quite significant and determining the excellence of her research. On the other hand, the quality and impact of the reported achievements can also be associated with the two cover features (ChemEurJ. 19/2017 and 17/2020) and the national and international conferences where these works have been presented (13 oral presentations and 11 posters.
PMB has participated as an active research team member in up to 10 national funded projects (2 of them as Principal Investigator, PI) in 2 different countries, at different pre- and postdoctoral affiliations. Her career has been greatly influenced by worldwide recognized names acting as: (i) supervisors; (ii) research group leaders of international short stays; and (iii) collaborators from public entities. In fact, 84.6% of her work are based on international collaborations. Appealing leadership skills have also been gained and demonstrated. On the one hand, PMB has shown abilities to funding applications. Besides pre- and postdoctoral short-stay grants, she obtained a Juan de la Cierva-Formación fellowship (FJCI-2015-23577). Moreover, PMB was awarded with a MSCA Fellowship CZ (call No. 02_22_010, OP JAK program) and recognized with the Seal of Excellence in H2020-MSCA-IF (2018: score 90/100 and 2020: score 85.2/100). Her research independence is defined by her role as PI in two occasions. PMB has been awarded with a competitive FUNMAT-FIP-2018 grant from the ICMAB Severo Ochoa programme (ref. SEV-2015-0496, budget: €41.5 K) and, more recently, with a Junior Leader Fellowship 2023-Incoming from La Caixa Foundation (ref: LCF/BQ/PI23/11970030, total budget: €297.9 K with €38.5 K/year for research costs). Regarding the training and mentoring activities, PMB is currently the official supervisor of two PhD students at ICMAB-CSIC. It is important to stress than one of them is fully funded with her La Caixa fellowship. On the other hand, she has officially acted as co-supervisor of a MSc Thesis (N. Capra, ICMAB-CSIC/ Parma Univ. 2019). Finally, PMB has acted as a member of thesis committees (Dr. A. Tamayo, Universitat Autònoma de Barcelona, Jun2022) and external evaluator (X. Peng, C. Oral, CEITEC-Brno University of Technology, Oct2023). All these merits reflect her dedication as a growing scientific leader and her scientific maturity progress.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | TOMAS , CARLA MERCEDES |
| **Referencia:** | RYC2023-043428-I |
| **Correo Electrónico:** | carla.de.tomas@gmail.com |
| **Título:** | Modelling and simulation of carbon materials for battery development |

**Resumen de la Memoria:**

During my international research career, I held 6 research positions in 4 countries. I did my PhD at the Universidad Autonoma de Barcelona, in the group of Prof. David Jou as part of the nanoTHERM CONSOLIDER-Ingenio project. There I developed methods to analyse phonon transport in semiconductor materials through classical thermodynamics. My work resulted in 5 publications.

After my PhD I moved to Perth, Australia. There I held a post-doctoral position for 4.5 years at Curtin University in the Carbon Group led by Prof. Marks. I worked on carbon materials and modelling methods using molecular dynamics. I rapidly became a well-known member of the international community of carbon science since modellers are scarce. I published 14 papers in the field, gathering invitations to give talks in international conferences and organised workshops. I also secured internal funds in competitive calls as PI (Curtin Institute for Computation) and co-PI (Haydn Williams program).

Then I obtained a competitive JSPS postdoctoral fellowship to visit Prof. Shiomi (University of Tokyo, January 2020). Despite COVID19 truncated that stage, I presented our work at the CARBON2022 conference (article in prep). In 2020 I took a senior researcher job in a start-up company, Happy Electron Ltd. (London, UK). My role was to guide the design of carbon electrodes to improve the efficiency of Li-ion batteries in electric vehicles. There I led a senior author paper (Carbon) on machine-learning. In 2021, I obtained a Marie Sklodowska-Curie Fellowship hosted by Prof. Titirici at Imperial College London. Here, I am applying my modelling skills to guide the design of optimised carbon anodes for Na-ion batteries. I have been 1 year (Oct 2022-2023) on maternity leave, I have currently restarted my fellowship.

My research project aims to advance the design of next-generation energy materials, particularly disordered carbon materials for lithium-free batteries, using a combination of molecular modeling and machine-learning techniques. I plan to address limitations in current simulation methods, which are constrained to small systems, by developing universal machine-learning potentials. These potentials will facilitate large-scale simulations of the electrochemical environment in batteries, focusing on realistic carbon electrodes for various chemistries. I want to optimize electrolyte formulations, explore doping strategies, and enhance the recyclability of battery materials. The ultimate goal is to guide the rational design of carbon electrodes, saving costs associated with trial-and-error experiments. My focus on Lithium-free batteries, such as Na-ion, K-ion, and Al-ion batteries, aligns with the broader objective of transitioning from fossil fuels to renewables, contributing to the EU's clean energy targets by developing efficient and affordable energy storage systems. My expertise and network of collaborators supports the feasibility of the project, which incorporates machine-learning-aided smart design and synthesis of optimized electrodes with potential technological impact. The outcome is expected to provide a comprehensive understanding of ion storage mechanisms in disordered carbons, leading to the development of high-performing lithium-free ion batteries at a lower cost than current Li-ion batteries, thereby contributing to the adoption of renewable energies.

**Resumen del Currículum Vitae:**

I am a computational materials scientist with a strong focus on modelling the nanostructure and properties of carbon-based materials for energy applications. The models I have developed employed atomistic simulation techniques such as molecular dynamics, density-functional theory and recently, machine learning. My research outputs comprise 2 databases (http://carbonpotentials.org/) and 24 peer reviewed articles, of which I am first or corresponding author in 12. These publications gathered 974 citations (H-index 15, Google Scholar 2024), mainly by experimental groups, attesting the impact of my modelling work in the community. My main articles have been published in leading journals in the field, including Nature Communications, Carbon and Physical Review Letters, a remarkable achievement for simulation works. My paper as last and corresponding author (Karasulu et al 2021) provided the largest database of carbon nanoclusters to date (>280,000 structures).

My international experience is attested by my global network of collaborators, having published with authors in Spain, Australia, Japan, China, USA, UK and France. I have received 12 invitations to present my work at international meetings and institutions, including a keynote talk at the CARBON2022 (UK) and the COLLOIDS2019 (Japan) conferences. Furthermore, I secured funding to co-organise 2 international workshops (CECAM Flagship workshop in Bordeaux, 2022; Carbon Science & Technology workshop in Perth, 2019).

During my various positions I have mentored scientists at various levels. In Australia, I supervised 5 BSc student projects (equivalent to TFG) and I co-supervised a PhD student (Dr Ali Aghajamali). Furthermore, my project funded by the Curtin Institute for Computation allowed me to employ and supervise a graduate student (Andrew Thomas). In the R&D start-up company, I supervised a junior researcher (Dr Patrick Rowe). Now, at Imperial College I am supervising a BSc student (Andreea Hedes). I have been a tribunal member in a PhD defence in Spain (Lluc Sendra, UAB 2023).

Furtermore, I have worked both in the private sector, in a R+D startup company in the UK (Happy Electron Ltd), doing research on batteries applied to electric vehicles. Therefore, I have experience in translational research beyond academia.

Outreach activities: I participated in the Indigenous Australian Engineering School, a program designed to engage young indigenous Australians in STEM, as well as being part of Curtin University Open Days (2018 and 2019), or the Battery Day 2022 at Imperial College London.

Editorial and Reviewing activities: I have peer-reviewed for the journals Carbon, Carbon Trends and Adsorption Science and Technology. I am a regular grant reviewer for the Japan Society for the Promotion of Science (JSPS). Since 2019 I am a member of the editorial team of Carbon (IF 10.9), the leading journal on carbon science.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | SILVA GUILLÉN, JOSE ANGEL |
| **Referencia:** | RYC2023-044383-I |
| **Correo Electrónico:** | josilgui@gmail.com |
| **Título:** | Theoretical investigation of novel two-dimensional materials |

**Resumen de la Memoria:**

Since the beginning of my career, I have been interested in the structural and electronic properties of layered materials and how these properties can be modified by means of different stimuli or tuning knobs such as the number of layers present in the system or strain. For this purpose, I have used first-principles calculations as a main tool. This type of calculations has been successful in the explanation as well as the prediction of different properties and physical phenomena in materials for many years.

I developed my Ph. D. studies in the "Theory and Simulation" group at ICN2 which is one of the core developers teams of the density functional theory code SIESTA. This allowed me to learn the fundamental as well as the applied knowledge needed to perform accurate first-principles calculations. During this time, my most important contribution was to the modelling of transition metal dichalcogenides (TMDC).

After defending my Ph. D. thesis, I moved to IMDEA Nanociencia as a postdoctoral fellow, where I continued my research on transition metal di- and tri-chalcogenides and how we could modify their electronic and optical properties by means of strain. After, I joined the School of Physics and Technology at Wuhan University as a Researcher which allowed me to have more independence as a researcher. This position also allowed me to mentor and supervise students and postdoctoral fellows. Furthermore, I became interested in a new way for tuning the electronic properties of materials: the change of the relative angle between two crystal lattices.

In 2021, I moved back to IMDEA as a Principal Investigator where I have been able to establish my own group and continue my independent research lines in addition to start new collaborations with experimental fellows. In these collaborations, I have led the theoretical part. Importantly, I have been granted a "Proyectos de Generación de Conocimiento 2022" as Principal Investigator. Up to now, I have participated in 21 research projects (3 european and 8 national) and I have been awarded more than 50 million computation hours as a Principal Investigator. Nowadays, I am co-directing two Ph. D. Thesis. At IMDEA, I am the coordinator of the Computation area as well as a member of the organizing and scientific committee of the seminar series.

Throughout my career, I have published 25 articles, some of them in high impact journals such as Chemical Society Reviews, Nature Communications, Nano Letters and Small. At the moment, my h-index is 14 and I have more than 1350 citations according to Scopus. With respect to congresses and workshops I have participated in 24 of them, including 7 invited and 5 oral contributions. I have also been in the organizing and scientific committees of 5 international workshops.

As a Ramón y Cajal research fellow, I will keep studying 2D materials, but focusing in three different branches: the effect of twist as a tuning knob for the electronic properties of different materials, the electronic and structural properties of tellurium-based TMDC and the study of the optical properties of van der Waals materials which I have been attracted to lately. This works will allow me to consolidate several national and international collaborations both experimental and theoretical.

**Resumen del Currículum Vitae:**

Since the early stages of my scientific career I have studied the electronic and structural properties of materials by means of density functional theory. My main interests nowadays are a variety of systems, ranging from two-dimensional (2D) materials to twisted systems with especial emphasis in the understanding of the effect of different tuning knobs in their structural, electronic and optical properties.

During the development of my Ph. D. Thesis I became an expert in the application of first-principles calculations to study layered materials. My most important contributions during this period were the understanding of the two-band superconducting nature of NbSe2 and the development of a tight-binding model for transition metal dichalcogenides. These works were carried out in collaboration with the groups of Prof. Roditchev (Sorbonne Université) and Prof. Guinea (ICMM at the time), respectively.

In 2015 I moved to the group of Prof. Guinea at IMDEA Nanociencia. There, I was able to blend seamlessly since my expertise in density functional theory calculations complement the tight-binding and continuum models developed in the group very well. I continued my research in different families of 2D materials, with the addition of the study of how different external stimuli affect their electronic and optical properties.

Then, I moved to the group of Prof. Shengjun Yuan at Wuhan University. There, I was able to increase my independence as a researcher. At the time, I started mentoring several undergraduate and graduate students which continue presently. Moreover, I also became interested by twisted bilayer systems.

Finally, since April 2021 I am a Principal Investigator (PI) at IMDEA Nanociencia. Recently I have been granted a "Proyectos de Generación de Conocimiento 2022", NOVMOMAT, as co-PI. I am also co-directing a Thesis and expect to start a new one since NOVMOMAT was conceded an "FPI" grant.

Concerning the participation in congresses, I would like to highlight that I have been invited to participate in two SIESTA schools. In total, I have participated in 24 congress, workshops and talks at different institutions, including 7 invited and 5 oral contributions. Moreover, I have organized five

international workshops and currently I am in the organizing committee of the "14th Early Stage Researchers Workshop" that will be held this year and the organizing and scientific committees of the IMDEA seminar series.

With respect to the dissemination of my work for the general public I was invited to give a talk in the series " Villena en la frontera del conocimiento" and to the " Bienal Ciencia y Madrid" . Currently, I am involved in the activities of the dissemination office of IMDEA as well as organizing several visits to high schools in my hometown.

I have been a reviewer for 8 different journals (Nature Communications and Physical Review X among them) and I am an evaluator for the "Agencia Estatal de Investigación" and the SONATA BIS programme of the National Science Center of Poland. As a summary, I am author of 25 publications (including high-impact journals such as Chemical Society Reviews, Nature Comms., Nano Letters and Small). My Hirsch-index is 14 and I have been cited more than 1350 times according to Scopus. Besides NOVMOMAT, I have participated in 21 research projects, three european, eight national and two regional.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | GRAHAM , JOSEPH |
| **Referencia:** | RYC2023-045139-I |
| **Correo Electrónico:** | grahamjose@mst.edu |
| **Título:** | Ion-Matter Interactions in Ceramics and Insulators |

**Resumen de la Memoria:**

I intend to study the effects of radiation in ceramics and insulators. Within this broader topic, I envision two specific research themes. The first will be a continuation of my work in the area of ceramics with applications in nuclear fission and fusion energy. The second will explore the basic science of the ion-matter interaction with an emphasis on studying the short time-scale electron dynamics of the ion interaction event. In the first research theme, I will lead ion irradiation studies to investigate the radiation response and damage evolution of ultra-high temperature ceramics (UHTCs), oxides, and optoelectronic materials. New classes of materials that are currently attracting my attention: include high entropy carbides and doped carbides for advanced nuclear fuels and first wall materials for fusion reactors, high entropy oxides for radiation detectors and coatings, and optical materials for diagnostic instrumentation in fission and fusion reactors. The second theme of my research line considers the basic science of radiation effects. I will lead an in-depth study of the short timescale electron dynamics in the ion-matter interaction. This project will attempt to provide a deeper understanding of transfer of energy from swift ions to electrons and from electrons to atoms in semiconducting and insulating systems.

**Resumen del Currículum Vitae:**

The main subject of my research has been studying the effects of ionizing radiation in insulators and ceramics including: radiation effects in ultra-high temperature ceramics, non-destructive characterization of nuclear fuel, radiation effects in oxides, and short-timescale dynamics of the ion-matter interaction. My work has been disseminated through 40+ journal publications, 11 conference papers, 19 abstracted oral presentations, and university seminars. Much of this work has formed the basis of theses for Ph.D. and masters students. As a faculty member, I have advised 7 doctoral students and 4 masters students. As a doctoral committee member, I have also been involved in the research of several Ph.D. students from other groups, departments, and Universities. My research has been conducted through collaborations with groups in the U.S. and around the world including the University of Tenneessee, Knoxville, Oak Ridge, Sandia, and Idaho National Laboratories, the Universidad Autonoma de Madrid, University of Helsinki, and the Canadian Nuclear Laboratories.

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | ABBADESSA , ANNA |
| **Referencia:** | RYC2023-045457-I |
| **Correo Electrónico:** | abbadessaanna@gmail.com |
| **Título:** | Translational and sustainable biomaterials for drug delivery and regenerative medicine |

**Resumen de la Memoria:**

Mobility and international experience

I obtained my Master degree in Pharmacy at the University of Chieti (IT) and later started a junior research position at the same university. In 2012, I obtained a personal fellowship, which allowed me to spend 11 months in the laboratory of Prof. W. Hennink (Utrecht University, NL), a worldwide leader in Pharmaceutical Science (h-index 134). Later, I accepted a PhD position offered by him and defended my PhD thesis in 2017. I did my first post-doc at the Royal Institute of Technology (KTH, SE), a top university in Engineering and Technology (31st-28th position in the QS World University Ranking 2020-22), and later joined as a post-doc the laboratory of Prof. M.J. Alonso (University of Santiago de Compostela, USC, ES), a global leader in Pharmaceutical Technology (h-index 103). I am currently a principal investigator (PI) at USC under the framework of the "la Caixa" Junior Leader program.

Scientific contributions

Over the years, I made my impact in the field of material science applied to biomedicine (my main research area) and sustainability. I contributed to the biomedical field thanks to my unique set of competences in drug delivery and tissue engineering. One of my pre-doctoral works (first author) on protein delivery has been published in the Journal of Controlled Release (IF 10.8, 134 cites). In the EU project HydroZONES, I pioneered and developed a novel class of 3D printable hydrogels for cartilage regeneration. As a result of my sole PhD work, I published 7 scientific articles, most of which as first author. The excellence of my PhD thesis received an award by the company PolyVation BV (NL), by Utrecht University, and by the Dutch Society NBTE. In the EU project MEFISTO, I led the collaboration with the global company Geistlich Pharma and other EU partners for the development of a novel meniscus substitute. I extended my expertise to bone regeneration, which resulted in my most cited paper (313 cites). I demonstrated my versatility with my first post-doc at KTH. There, I developed novel sustainable biomaterials for food packaging and drug delivery, leading the collaboration with the company Ecohelix (SE). This partnership resulted in the 2 first scientific articles on Ecohelix main product and its application (both as CA). In 2023, as a proof of my independence, I published a review article as CA with co-authors not belonging to any of my present or past affiliations. I gave more than 40 international presentations (3 as invited speaker), collaborated with 19 top European laboratories, and attended 15 trainings.

My publications (71% of which as first or CA) received 964 citations (h-index 11, 5 papers with more than 100 cites, most cited paper 313 cites, Google Scholar). 50% of my papers were published in Q1-D1 journals and 71% in Q1 journals. Importantly, when considering only the papers where I am first author or CA, all except two were published in Q1-D1 journals, demonstrating the highest quality for those I had a leading role. I attracted personal research funds for a total of 485 k€, of which 300 k€ came from the prestigious "la Caixa" Junior Leader Fellowship 2022, after a competitive selection process (4.6% success rate). This allowed me to start my own research group as PI.

**Resumen del Currículum Vitae:**

Career
I obtained my Master degree in Pharmacy at the University of Chieti (IT) and later started a junior research position at the same university. In 2012, I obtained a personal fellowship, which allowed me to spend 11 months in the laboratory of Prof. W. Hennink (Utrecht University, NL), a worldwide leader in Pharmaceutical Science (h-index 134). Later, I accepted a PhD position offered by him and defended my PhD thesis in 2017. I did my first post-doc at the Royal Institute of Technology (KTH, SE), a top university in Engineering and Technology (31st-28th position in the QS World University Ranking 2020-22), and later joined as a post-doc the laboratory of Prof. M.J. Alonso (University of Santiago de Compostela, USC, ES), a global leader in Pharmaceutical Technology (h-index 103). I am currently a principal investigator (PI) at USC under the framework of the "la Caixa" Junior Leader program.

Statistics
My publications (71% of which as first or corresponding author) received 964 citations (h-index 11, 5 papers with more than 100 cites, most cited paper 313 cites). 50% of my papers were published in Q1-D1 journals and 71% in Q1 journals. Importantly, when considering only the papers where I am first author or CA, all except two were published in Q1-D1 journals. I attracted personal research funds for a total of 485 k€, of which 300 k€ came from the prestigious "la Caixa" Junior Leader Fellowship 2022, after a competitive selection process (4.6% success rate). This allowed me to start my own research group as PI.

Leadership
Besides the "la Caixa" project where I am PI, I participated, over the years, in other 8 international and national projects (total fund>25 MEur) in collaboration with 19 top laboratories in Europe and 7 industrial partners. Under the "la Caixa" project, I hired and currently supervise a PhD student. I supervised 9 Bachelor/Master students and performed teaching activities (220 hours) at universities in Italy, Netherlands, and Spain. In 2023, I was member of a PhD defence committee at the University of Oviedo, guest editor of the Journal of Functional Biomaterials and, over the years, reviewer for several journals in the biomedical field. I was evaluator for the International Conference ICONAN 2024, for the young delegates competition during

the National Congress of the Italian Society of Biomaterials 2023, and for the 2021 Graduate Women in Science (GWIS) National Fellowship Program in collaboration with the University of Pennsylvania (USA).

Industrial partnership
I have a long-term experience in industrial partnership. I paved the path for the clinical translation of the biomaterial developed during my PhD by collaborating with the company Polyvation BV (NL). In the field of sustainability, I contributed to the success of the KTH spin-off company Ecohelix (SE). In MEFISTO project, I led the collaboration with the world-leading company Geistlich Pharma.

Communication
I gave 3 invited talks, 8 oral and 4 poster presentations at international conferences and workshops, 7 colloquia at Utrecht University, and over 20 international presentations at universities and companies in the framework of the projects where I have been involved. My PI profile and research activity have been highlighted in more than 10 media outlets.

Awards
Hydro Zones PhD travel award
PhD thesis award Utrecht university

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| **Área Temática:** | Ciencias y tecnologías de materiales |
| **Nombre:** | GARCÍA TECEDOR, MIGUEL |
| **Referencia:** | RYC2023-044407-I |
| **Correo Electrónico:** | mik2388@gmail.com |
| **Título:** | Photoelectrocatalytic Generation of Solar Fuels by Novel Hybrid Semiconductors (TRANSFORM) |

**Resumen de la Memoria:**

Miguel García Tecedor (MGT), presents an exceptional mobility after having been a staff member in 3 different scientific institutions (Universidad Complutense de Madrid, Universitat Jaume I and IMDEA Energy). Additionally, he has completed research stays in 5 different scientific institutions (Institute for Energy and Technology-IFE, Imperial College London-ICL, Universita' degli Studi di Messina-UDM, Universidade do Porto-UPORTO, and Institut Català d'Investigació Química-ICIQ) and 3 singular facilities (Elttra, Diamond and ALBA). All this mobility has crystallised in the publication of 44 scientific contributions, divided in 40 published papers (7 as corresponding author, 13 as first author, 2 as last author and 19 published in open access), 3 patents (1 as first author and another under exploitation) and 1 book-chapter.

On the other hand, the candidate presents a remarkable internationalization, demonstrated in the participation on 5 European projects, 33 international scientific congresses (with 10 oral contributions, 2 invited) and visiting research stays on 6 different foreign research institutions (IFE, ICL, UDM, UPORTO, Elettra and Diamond). Apart from the institutions abroad where MGT has directly worked, he has been also involved in other relevant international collaborations as detailed in the scientific report. Besides, the 65% of his publications (26/40) and 67% of his patents (2/3) are international collaborations.

Since the beginning of his career, MGT has demonstrated his ability to establish new research lines and organise and lead different research projects. In this direction, MGT has managed to secure funds as principal investigator as well as actively participate in the development of all the projects in which he has worked, leading part of them and achieving the set objectives. Specifically, MGT has participated in 14 research projects (5 European, 7 National, 1 Regional and 1 private) and submitted 7 projects as principal investigator (PI). Specifically, MGT is PI of the projects RESTORE (La Caixa Junior Leader, 2022) and 2D-Photo2Change (TED 2021), with a total budget above 465000€ Additionally, MGT is PI of 3 synchrotron proposals (after attending 11 synchrotron beamtimes along his career). Indeed, MGT is currently leading two main research lines, one on novel approaches towards photoelectrocatalytic (PEC) biomass valorisation and the other one on automatization and robotization of PEC processes, counting with a five-people team. Other indication of the scientific maturity of MGT lies in his 7 publications as corresponding author. Furthermore, during his predoctoral and postdoctoral stages, MGT has been involved in the supervision of several internship (6), master (2) and predoctoral students (6). Currently, MGT is officially co-supervising two PhDs (Alejandro García and Javier Llorente). Due to all the above-mentioned merits MGT has been recently recognized with the R3 certificate.

Regarding the proposed research line, TRANSFORM project proposes the design and fabrication of a novel and efficient photoelectrocatalytic (PEC) reactor for the generation of solar fuels and added-value chemicals coupling the photoelectrocatalytic generation of solar ammonia via nitrogen reduction reaction (N2RR), with the oxidation of biomass products, being a sustainable alternative for the energy market and the chemical industry.

**Resumen del Currículum Vitae:**

Miguel García Tecedor, MGT, (MSc. Applied Physics, 2013, International PhD. Physics 2017, both at Universidad Complutense de Madrid, UCM) is a Senior Assistant Researcher at the Photoactivated Processes Unit (PhPU), at IMDEA Energy. During his PhD, he developed his research at the FINE (Physics of Electronic Nanomaterials) group at UCM, under the supervision of Profs. Ana Cremades and David Maestre, on the growth and characterization of semiconducting nanostructures and their applications in optoelectronics. In 2015, he joined the Institute for Energy Technology (IFE), located in Kjeller, Norway, for eight months, where he focused on the synthesis and characterization of organic-inorganic composites for silicon solar cells¿ passivation, in the framework of the European project SUSOX. In July 2017, MGT took a position as Research Scientist at the Institute of Advanced Materials (INAM) at Universitat Jaume I, under the supervision of Prof. Sixto Giménez, to develop novel strategies for (photo)electrocatalytic water splitting and CO2 reduction, in the framework of the European Project A-LEAF. Since he joined the INAM, he was focused on the understanding of physical processes in integrated PEC devices by different electrical, optical and chemical spectroscopies. In March 2021, MGT joined the PhPU, headed by Dr. Víctor A. de la Peña O' Shea, at IMDEA Energy as the researcher in charge of the experimental activities of the European Project HYSOLCHEM, focused on photoelectrocatalytic approaches towards wastewater oxidation, CO2 reduction and N2 fixation. Currently, MGT is leading two research lines, one on novel approaches towards photoelectrocatalytic (PEC) biomass valorisation and the other on automatization and robotization of PEC processes.

Along his career, MGT has participated in 14 research projects (5 European, 7 National, 1 Regional and 1 private) and submitted 7 projects as principal investigator (PI). Specifically, MGT is PI of the projects RESTORE (La Caixa Junior Leader, 2022) and 2D-Photo2Change (TED 2021). Additionally, MGT is PI of 3 synchrotron proposals. MGT is co-author of 44 scientific contributions, divided in 40 scientific papers (being first author in 13, corresponding author in 7, and last author in 2 of them), 3 patents (1 under exploitation), being first-author in 1 of them, and 1 book chapter. Additionally, MGT has completed several research stays in international scientific institutions, as Imperial College London, Universita' degli Studi di Messina, Universidade do Porto (UPORTO) and Institut Català d'Investigació Química (ICIQ) and performed experiments at facilities as Elettra, ALBA and Diamond synchrotrons. Furthermore, during his predoctoral and postdoctoral stages, MGT has been involved in the supervision of several undergraduate (2), master (5) and predoctoral students (6). Currently, MGT is officially co-supervising two PhDs (Alejandro García and Javier Llorente). He also has an extended outreach activity reflected on two online blogs, one dissemination article and transfer activities as his collaboration with Graphenea Semiconductor SL and APRIA Systems SL. MGT also got the accreditations of Prof. Ayudante Doctor, Prof. Contratado Doctor and Prof. Universidad Privada from ANECA.

Due to all the above-mentioned merits MGT has been recently recognized with the R3 certificate.

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| **Área Temática:** | **Ciencias y tecnologías de materiales** |
| **Nombre:** | ABOUDZADEH SAFARZADEH, MOHAMMAD ALI |
| **Referencia:** | RYC2023-042668-I |
| **Correo Electrónico:** | aliaboud2001@gmail.com |
| **Título:** | Improving the biodegradation process and potential biomedical applications of bioplastics using sugar-based nanostructured materials |

**Resumen de la Memoria:**

Biomedical application of some long-term degrading bioplastics such as polycaprolactone (PCL) or polylactic acid (PLA) has superseded by disadvantages associated with long-term degradation (up to 3-4 years) and weak mechanical properties. The aim of the proposed research line is to overcome these limitations by preparing new co-polyesters and designing additives based on nanostructured sugars, i.e. "polysaccharides", into the bioplastic matrix. The presence of polysaccharide building block as a nanostructuring agent within the polymer matrix can significantly enhance the degradation rate and mechanical properties of the final material simultaneously and thereby increase its potential applications for the design of novel biodegradable materials to be used for in vivo biomedical devices, tissue engineering or food packaging. The characterization of the mechanical and crystalline properties of obtained sugar-based additives is an important aspect to anticipate the final properties of the bioplastic with a view to biomaterials applications, tissue engineering fields or degradable packaging. Another major motivation of using polysaccharides in the formula of our additives is to accelerate the biodegradation process that will help to design of novel biomaterials with targeting properties. Therefore, the candidate during this project will also study the biodegradability and biocompatibility behavior of sugar-based additives in the polymer matrix by in vitro degradation and biological studies.

The multidisciplinary approach of this research line involving organic/polymer chemistry, green chemistry, polymer physics, biodegradability and biology is the key to the success of the project. This multidisciplinary project represents an ambitious step forwards the state-of-the-art and the research methodology is crucial to an efficient and timely solution to the proposed problems. The candidate will employ state-of-the-art techniques to follow the synthesis and characterization of the modified bioplastics and their final applications.

The candidate, Dr. M. Ali Aboudzadeh, has a strong background in polymer science achieved through his PhD thesis at the University of the Basque Country (EHU/UPV) and his 4 years working experience in industry. In addition, he has nine years of postdoctoral fellowship in different institutes. However, the candidate is still at the beginning of his academic career and a successful handling of this fellowship will allow him to complement his scientific background with expertise in a highly dynamic research field. The final goal of this five-year fellowship program is to advance and diversify the competences of Dr. Aboudzadeh both as a researcher and as a future leader in the multidisciplinary field of polymeric materials for a sustainable world. This research project is highly multidisciplinary combining organic/polymer synthesis, polymer physics and green chemistry. Any potential host group for this fellowship will strongly benefit from applicant's research activity, as his scientific profile is perfect match for the proposed research line.

**Resumen del Currículum Vitae:**

The candidate did BSc & MSc on Polymer Engineering in his own country (Iran). After finishing master degree he moved to industry and started working in Mehr Cam Pars Co. (biggest manufacturer of automotive polymeric parts in Iran) in the field of polymer processing and painting of the plastic parts. During this job, he was teaching bachelor students in the University of Applied Science and Technology that belongs to that company. After working for more than 4 years in industrial sector and as he was always interested in fundamental research, he moved to Europe to continue his studies. He started PhD in Jan 2011 with a grant from UPV/EHU under supervision of Prof. Mecerreyes. During PhD, he worked extensively on the synthesis and characterization of supramolecular ionic networks and he became skilled in different areas of polymer science.

His thesis led to the publication of 9 papers (all in Q1 category) in high impact factor journals. 7 years later in 2022, he edited a book in Springer Nature on the topic of his PhD thesis.

During Phd, he spent 6 months at Institute for Frontier Materials-Deakin University, Australia under the supervision of Maria Forsyth (a world expert in batteries). Also in the last year of PhD, he spent 1 month in the group of Jairton Dupont (a pioneer in ionic liquids) in UFRGS, Porto Alegre, Brazil.

After a successful PhD defense in February 2015 (cum laude) he did several postdoctoral fellowships in different institutes. First, he was awarded a competitive postdoc grant to stay at the same research group until the end of year 2015. In this period, he investigated controlled radical polymerization using a RAFT agent to synthesize block copolymers for solid electrolytes applications. At the beginning of the year 2016, he was selected for a one-year postdoc contract with BioDonostia research center through a national project from ISCIII. There, his main research line was to develop of an economic, rapid and sensitive sensor to detect circulating DNA biomarkers associated with cancer. From January 2017 until the end of March 2018, he was occupying another postdoc position in POLYMAT and his main research topic was focused on microencapsulation of natural antioxidants for food/pharmacy applications. Exploring this topic provided him some opportunities/collaborations; above all in 2020 he edited a book in Springer Nature entitled about on topic including authors from all around the world. Also, he edited two special issues entitled "Function of Polymers in Encapsulation Process Vol. I & Vol. II" in journal Polymers from MDPI. Since October 2018 until March 2021 he was working as a postdoc researcher in Donostia International Physics Center, where he was investigating on cyclic polymer/gold nanoparticles hybrid materials for biomedical applications. Then he moved to France, in CNRS, IPREM institute through a very prestigious competitive proposal-based grant, Marie Curie standard fellowship that he was awarded beforehand in 2020 and his main research was on developing stable and versatile photo-active core-shell submicronic polymer colloids. Currently, he is working in the group Prof. Müller in UPV/EHU benefiting from María Zambrano grant funded by the next generation EU. Nowadays he is coordinating an Interreg-POCTEFA 3-year project funded by FEDER as well as co-directing a PhD student.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | MOLINA VENEGAS, RAFAEL |
| **Referencia:** | RYC2023-044256-I |
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| **Título:** | Phylogenetic Plant Ecologist |

**Resumen de la Memoria:**

I have devoted a good part of my research to unraveling the intricate interplay of contemporary, historical, and evolutionary factors that determine the distribution of species assemblages across spatial scales, with a particular focus on Mediterranean plants (research line 1, eco-evolutionary mechanisms shaping species assemblages). My contributions have significantly deepened our understanding of Mediterranean biodiversity as dynamic assemblages, underscoring the paramount importance of evolutionary history.

Complementing this, I have pursued a methodological research line that originated during my PhD and matured during my postdoctoral work (research line 2, development of phylogenetic methods). The outcomes of my research have played a pivotal role in standardizing analytical procedures within phylogenetic analyses, with some of my methodologies evolving into benchmarks across diverse disciplines. I have actively contributed to the dissemination of my research by creating several R functions and packages, both as first author and through the training of emerging scholars, fostering an open-access approach through Free Software.

Having spent two years at the University of Bern in Switzerland, I gained insights into the critical importance of preserving the Tree of Life to ensure human well-being. As a project Principal Investigator (PI), I have successfully secured 160,000 euros through competitive channels, including a recently granted Plan Nacional project, to further investigate this avenue of research (research line 3, links between biodiversity and human well-being). My findings have laid empirical foundations connecting the evolutionary history of species with the tangible benefits derived from biodiversity. Invitations to speak at international conferences attest to the impact of my research, and I continue to mentor MSc and PhD students in this evolving field.

My current Plan Nacional project, entitled "Healing Phylogenies: eco-phylogenetic approaches for preserving, prospecting, and understanding the medicinal potential of plant biodiversity (HEALPHY)", represents the culmination of my expertise. Rooted in an interdisciplinary approach, this project explores both hypothesis-driven and exploratory questions that were ignited during my postdoc in Switzerland and refined as a TALENTO fellow in Spain. HEALPHY focuses on three distinct research axes: (1) preserving the medicinal potential of biodiversity using eco-phylogenetic methods, (2) prospecting a natural storehouse of yet-to-be-discovered benefits, and (3) understanding the historical selection of medicinal plants by human groups. As the sole PI, I lead a team of nine researchers from institutions across Europe, North America, and Ecuador. Currently serving as an Assistant Professor at UAM, I am committed to advancing this ambitious research agenda and mentoring the next generation of scholars in the field.

**Resumen del Currículum Vitae:**

I have authored and contributed to a robust body of academic work, comprising 40 papers in SCI-indexed journals. Notably, I have served as the first and corresponding author in 25 of these publications, with four being solo endeavors. My scholarly output also extends to four book chapters, of which I am the primary author in two instances. Additionally, I have crafted four engaging popular science articles, each delving into the nuances of my three distinct research lines. The majority of my contributions find their place in Q1 journals, including prestigious publications like Nature Plants, Nature Ecology and Evolution, and Nature Communications. Evidencing the impact of my work, it has garnered over 1100 citations on Google Scholar.

In terms of dissemination, I regularly present my findings at national and international congresses, where I have been invited as a speaker. Noteworthy are the two symposia I organized within these events, showcasing the significance of my research lines. Furthermore, I have proposed a symposium for the upcoming XX International Botanical Congress, a platform that will amplify the reach of my research agenda in the years to come.

Collaboration is a cornerstone in my research, involving participation in international consortia with scientists worldwide and cultivating a robust network of national collaborators. I have contributed to over 10 competitive tender projects, including a recently granted Plan National project as the sole Principal Investigator. In terms of mentorship, I am currently guiding one Ph.D. student and have mentored eight M.Sc. and B.Sc. students, some of whom are now forging scientific careers.

My commitment to knowledge dissemination is evident through the delivery of five comprehensive postgraduate phylogenetic courses, conducted in collaboration with esteemed universities and private entities. Additionally, I play a role in the Spanish National Agency of Evaluation and Prospective, evaluating two tender projects. As an editor for Frontiers in Plant Science, I actively contribute to the academic discourse.

Beyond academia, I engage with diverse audiences through citizen-oriented initiatives, including radio interviews, participation in the Science and Innovation Week of Madrid, involvement in the Scientix Stem Discovery programme, stakeholder workshops, and a knowledge transfer project aimed at enhancing the accessibility of botanical terminology featured in the RAE dictionary. These endeavors underscore my dedication to bridging the gap between scientific research and broader societal understanding.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | GIRONA HERNÁNDEZ, JOSÉ TÁRSILO |
| **Referencia:** | RYC2023-043480-I |
| **Correo Electrónico:** | tarsilo.girona@gmail.com |
| **Título:** | Anticipating extreme geological events: volcanic eruption forecasts through the development of data assimilation and pattern recognition strategies |

**Resumen de la Memoria:**

Dr. Társilo Girona's research constitutes a pioneering exploration at the intersection of fundamental geophysics and practical applications, driven by an unwavering commitment to unravel the mechanisms governing volcanoes and faults. His endeavors are geared towards decoding these mechanisms but also towards contributing to the forecasting of eruptions and major earthquakes through the development of innovative frameworks. This all-encompassing strategy blends process-based models with diverse datasets, employing a synergistic fusion of computational simulations, empirical experimentation, and meticulous on-site field studies. The specific focus of these investigations lies in unraveling the intricacies of fluid dynamics within porous media, a key element in understanding geological phenomena. Within this intricate framework, statistical techniques assume a central role, not merely as auxiliary tools but as pivotal contributors that significantly elevate the predictive prowess of Dr. Társilo Girona's models. Their incorporation acts as a linchpin, enabling the early identification of precursory signals and fortifying the effectiveness of hazard assessment in the dynamic realm of volcanic and seismic activity.

Dr. Girona's research program focuses primarily on analyzing thermal and seismic unrest in volcanoes and active faults. For example, he pioneered a methodology utilizing satellite-based thermal infrared data that revealed that volcanoes can release heat over large areas for years prior to eruption. This discovery, published in Nature Geoscience in 2021, offers new insights into volcano-hydrothermal processes, represents a change of paradigm in our understanding of how volcanoes reactivate, and led to widespread media coverage (e.g., by The Wall Street Journal). Additionally, Dr. Girona's expertise in seismology involves unraveling the complexities of volcanic tremor. For example, his innovative models establish crucial connections between tremor and fluid transport within volcanoes, providing valuable insights into the underlying dynamics of volcanic activity. Furthermore, his application of advanced algorithms, leveraging artificial intelligence, contributes to ongoing efforts in near-real-time monitoring of natural events. This is instrumental in seismic surveillance and hazard assessment, underscoring a commitment to the practical applications of his research.

In essence, Dr. Girona's research trajectory stands out for its all-encompassing and interdisciplinary character, skillfully intertwining the domains of geophysics, fluid dynamics, satellite data analysis, and artificial intelligence. His groundbreaking methodologies and discoveries act as catalysts, propelling our understanding of the intricate processes shaping the solid Earth. This diverse and innovative approach not only drives notable advancements in forecasting capabilities and monitoring techniques but also positions Dr. Girona at the forefront of geophysics research. Effectively bridging the theoretical and practical realms, his work manifests as a pivotal contribution to the ongoing evolution of the field. Driven by an unwavering commitment to expanding the horizons of knowledge, Dr. Girona actively steers the trajectory of future research, focusing on unraveling the mysteries of how nature works.

**Resumen del Currículum Vitae:**

Dr. Társilo Girona is Research Assitant Professor of Volcanology at the University of Alaska Fairbanks Geophysical Institute, where he is also head of the Volcanology Group and seismologist at the Alaska Volcano Observatory. He is BSc in Physics and MSc in Geophysics and Meteorology from Complutense University of Madrid. He is also Data Scientist from University of California, Los Angeles, and obtained his PhD from Nanyang Technological University, Singapore. His doctoral research, focused on unraveling volcanic degassing through novel data analyses and physics-based modeling, earned him the 2016 Natural Hazards Award for Graduate Research from the American Geophysical Union. Dr. Girona's work has also garnered him the 2019 Outstanding Postdoctoral Research Award from NASA's Jet Propulsion Laboratory and the 2023 IUGG Early Career Scientist Award, a high honor presented by the International Union of Geodesy and Geophysics to early career scientists for their "outstanding research in Earth and space sciences and for their international research cooperation".

His scientific production includes 22 peer-reviewed publications in SCI journals (41% as first author; >840 citations; h-index=14; i10-index=15). Dr. Girona's work has been featured in Q1 journals, including Nature Geoscience, Science, Proceedings of the National Academy of Sciences of the United States of America, Geology, and Scientific Reports, among others. He has currently 4 manuscripts under review, two of them in Nature and Nature Communications. Dr. Girona has 70 contributions to international conferences (32 as presenter; 7 invited), including AGU Fall Meeting, EGU General Assembly, and IUGG General Assembly.

He has reviewed 41 manuscripts and 2 USA National Science Foundation proposals, and served on a 2020 NASA review panel. He co-edited 2 special issues and was nvited to give talks by collaborators from 23 institutions, including Stanford University (2015), Lamont-Doherty Earth Observatory - Columbia University (2017, 2020), University of Alicante (2018), California Institute of Technology (2019), University of Tokyo (2021), GFZ German Research Centre for Geoscience (2021), Paris Institute of Planetary Physics (2023), and National Institute of Geophysics and Volcanology, Italy (2023).

Dr. Girona has been Principal Investigator in 4 NASA projects (2017 Postdoctoral Fellowship, 2020 New Investigator in Earth Science, 2020 Future Investigator in NASA Earth and Space Science and Technology Research, and 2023 Earth Surface and Interior programs). He is also Co-Investigator in 3 other projects, funded by the 2020 NASA Earth Surface and Interior, 2020 NASA Interdisciplinary Science, and 2019 National Science Foundation PREEVENTS programs.

He is currently supervising 3  PhD students and 1 postdoctoral researcher, and supervised 1 MSc student who graduated in 2023. He has been Lecturer at the 2022 Volatiles from Source to Surface Workshop at Montana State University and the 203 Cooperative Institute for Dynamic Earth Research Workshop at University of California, Berkeley. He also transfers knowledge to society through outreach activities (including 5 press released and multiple talks in high schools); and collaborates with governmental agencies worldwide to implement his methods for near-real time monitoring and forecasting of extreme natural events.

**Resumen de la Memoria:**

My research broadly aims to understand the patterns and processes regulating biodiversity and the effects of disturbance in deep seafloor ecosystems. Some of my most remarkable contributions to this field stem from developing novel image-based approaches using underwater robots (e.g. Remotely Operated Vehicles, ROVs, and Autonomous Underwater Vehicles, AUVs) to study environmental controls in abyssal communities (depths: 3000 – 6000m) and their resilience to growing human impacts, like deep-sea mining or climate change.

During my career, I have worked in different aspects of deep-sea benthic research, including community ecology, biogeography, habitat mapping, image-analysis, taxonomy, ecosystem function, carbon transfer, anthropogenic impacts and marine conservation. Significant scientific contributions to the generation of high-impact peer-reviewed articles (32 papers: 28 in IF>2.9 journals, from which 3 in IF>10; 7 first author, 1 last author, and 6 without PhD supervisors; total impact since 2019: 999 citations, h=16, i10=20 in G-Scholar), international conferences (2 special session editor/chair and >20 oral presentations), methodological and policy workshops (>10), and technical reports for industry and regulators (>10), have consolidated my leadership in the field around 4 scientific lines that are intimately linked in deep-sea research and that I gradually developed during different carrier stages . These are: Biodiversity Exploration, Anthropogenic impact, Policy & Conservation, and Macroecology. Overall, I gathered >2M € for for this research.

Most remarkably, I have led an international group (>20 researchers) aimed to standardise image-based biodiversity data in the N Pacific seafloor, and thereby investigation of biogeographic patterns for the first-time across a vast abyssal basin. Early outcomes of this initiative triggered regulatory changes in the Regional Environmental Management Plan of the CCZ (addition of 2 new mining-protected areas) by the International Seabed Authority (ISA, regulator established by UN) in 2020, following technical recommendations arising from a BD Synthesis workshop and report where I led the Megafauna theme. Pursuing this line of research, I lead a study recently published in Nature Ecology & Evolution unveiling the existence of two distinct biogeographical provinces in the abyssal Pacific, setting the foundations for novel application of my novel image-based approach to the study of macroecological patterns and thereby connectivity in the deep ocean.

I plan to conduct my future research in collaboration with the CSIC, developing cutting-edge strategies for Atlantic and Mediterranean deep ocean conservation, monitoring and mapping, centred on networks of MPAs. For this purpose, I am currently writing an ERC Starting Grant proposal (Oct' 24), and others (e.g. Plan Nacional) aimed to integrate my image-based numerical approach with state-of-the-art functional and molecular (i.e. omics) methods in deep-sea macroecology. As such, I believe that my expertise and the research I plan to conduct will advance and then consolidate a research line that is currently lacking across CSIC's marine research areas and that I am capacitated to lead forward.

**Resumen del Currículum Vitae:**

Since receiving my PhD in 2019 (though successfully defended in Oct 2018) I raised over €2M from public and private funders to lead paradigm-breaking studies and environmental research programmes in numerical aspects of deep-sea ecology, engaging with academics, regulators and industry partners to develop novel image-based approaches using underwater robots to assess biodiversity patterns and resilience of seabed ecosystems to growing anthropogenic impacts in the deep ocean.

At pre-doctoral stage, I participated in 2 large multidisciplinary EU deep-sea research projects (MIDAS and JPI-Oceans I). Right after defending my PhD thesis in Nov 2018 (though note my title was expended in Jun 2019), I secured a Postdoctoral Fellowship at the National Oceanography Centre (NOC, UK) to work in the Commonwealth Marine Economies Programme (UK Gov). I've been since PI or Co-PI of 3 industry-commissioned research projects assessing baseline ecology patterns and responses to industrial activities in seabed mining exploration-licensed areas in the N Pacific, granting promotions to Junior (in 2020) and Senior Researcher (permanent since 2023) at the NOC. I also lead Objective 5.2 (Image-based numerical ecology) in project SMARTEX (NERC UK). To conduct this work, I currently lead a team of researchers at different formation stages (2 technicians I line-manage; 2 PhD students I co-supervise; and 1 Postdoc), which I train in key aspects of underwater sampling with different platform technologies, image processing, benthic taxonomy and coding for ecological modelling.

I have published a total of 32 peer-reviewed articles (7 as first author, 1 as last; 28 papers in IF > 2.9 journals, from which, 3 in IF> 10), on different aspects of deep-sea research and technology, including spatial ecology, taxonomy, ecosystem function, carbon transfer, image-sampling methods, habitat mapping, and environmental disturbance, yielding a total impact of 999 citations since 2019 (h=16, i10=20, source: G-Scholar).

I have also been lead-scientist for image-based megabenthic components in 5/6 deep-sea research expeditions, totalling >200 days at sea: 4 in the N Pacific (2 in MIDAS and SMARTEX projects; 2 with industry), 1 in the S Pacific (JPIO project), and 1 in the N Atlantic (invited by iAtlantic project).

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | LI , DONGSHUAI |
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| **Correo Electrónico:** | dongshuaili@gmail.com |
| **Título:** | Studying Lightning Processes on Microsecond Time Scales: Advancing Protection Strategies |

**Resumen de la Memoria:**

Lightning, a transient and energetic natural phenomenon on Earth, has fascinated scientists for centuries. Since Benjamin Franklin's first kite experiment 250 years ago, ground-based radio sensors, satellite lightning imagers and advances in atmospheric science have provided valuable insights into the physical mechanism of lightning discharges and their impact on Earth's climate. However, despite these advancements, lightning is still one of the least understood processes in the Earth sciences.

The key to understanding, how lightning initiates inside thunderstorms, how it propagates within the clouds and how it attaches to natural and human-made structures, is to map them out on microsecond timescales, addressing the streamer and leader modes at the heart of lightning physics. Streamers are propagating ionization fronts creating filaments of low-density, cold plasma. In contrast, leaders are hot and highly ionized plasma with high electrical conductivity. However, due to the challenges in obtaining in situ measurements of cloud environmental and electrical characteristics in the specific regions where streamers and leaders form, and the difficulty in replicating the complex environmental conditions in a laboratory, our understanding of the interplay between streamers and leaders is still very limited.

During the past years, my research focuses on understanding lightning physics and the accuracies and limitations of lightning detection systems. I have developed a full-wave, terrain-based model to evaluate the accuracy of electromagnetic (EM) lightning detection systems in complex terrain at close, medium, and far ranges. I have studied small-scale streamer processes by combining both EM and optical band using ground-based sensors and space-based spectral detectors. My findings showed that EM signals called Narrow Bipolar Events manifest as flashes of blue emissions from bursts of streamers in clouds. The research is related to questions of how lightning initiates and propagates. My future research will continue to shed more light on this complex and mysterious aspect of lightning physics to address more scientific and technical challenges in determining the role of streamers and leaders in lightning initiation and propagation. The main research lines include: 1) analyzing optical emissions of different type of lightning; 2) investigating correlations between blue corona discharge and lightning initiation; 3) studying the thunderstorm types and cloud microphysical conditions; 4) investigating the physical mechanisms of different microsecond-scale processes and their connections with lightning initiation and propagation by combining both optical and radio bands; 5) designing and building high-resolution lightning protection/detection systems based on new techniques with industrial partners; 6) researching the nature of lightning and understanding the role of thunderstorms in a changing climate.

The research output will not only contribute to research the nature of lightning and understand lightning hazards to human societies in a changing climate but also holds significant practical value in developing and designing an unconventional lightning protection system for the increasingly sophisticated infrastructure, such as wind turbines, high-rise buildings, etc., through collaboration with European and Spanish companies.

**Resumen del Currículum Vitae:**

I am currently the PI of "Danmarks Frie Forskningsfond (DFF) Sapere Aude project" (4-years), (DFF Sapere Aude is the Danish biggest independent research project, with a success rate of 11%). the Co-PI of "European Space Agency (ESA)-OSIP project" (2-years) and the Co-PI/ Project Manager of a DFF project (3-years). I have been recognized as R3 certificated researcher for my excellence and leadership in the field of Clima y atmósfera.
My research has resulted in 56 publications with 20 as the first or corresponding author. During the past years, I conducted my study at world-class institutes in China, Switzerland, Spain and Denmark, allowing me to establish international collaborations and develop scientific independence and leadership.

During my PhD, I led 2 projects (1 public + 1 private) as PI from the National Excellent Doctoral Dissertation Funding and from the company Vaisala Ltd, Finland. In 2015, I received the International Research Fellowship as PI from the China Scholarship Council, conducting research at EPFL in Switzerland. My scientific outputs won the Richard B. Schulz Best Transactions Paper Award and VAISALA international scholarship. In 2016, I received my PhD degree with Excellent Doctoral Dissertation Award. Working at top-rated institutions, including ESMC&CDRC in China and IAA–CSIC in Spain, I reported and analysed for the first time the optical emissions of "blue" streamer discharges associated with narrow bipolar events (NBEs) around cloud tops. The work led to many publications and sparked interest in the community. In 2022, I worked at DTU Space as the Co-PI/Project Manager for a Danish Independent Research project. I investigated the different types of "blue" streamer discharges, which were highlighted in the annual Franklin lecture at AGU Fall Meeting. In 2023, I became the Co-PI of an ESA project to test neuromorphic imaging technology to study lightning from the International Space Station with ESA astronaut Andreas Mogensen. In 2024, I obtained a DFF Sapere Aude Project as PI, to establish my own research group at DTU Space. The project focuses on lightning processes on microsecond timescales, which hold the keys to understanding the initiation and propagation of lightning.

Contributions to society. I am the Recognized Reviewer in 10 different Q1/Q2 scientific journals. I am a Guest Editor for "Atmosphere" and "Frontiers in Earth Science" I am the Convener/Co-Chair/Outstanding Student Presentation Awards (OSPA) Judge for a session at AGU Fall Meeting. I am a Project Proposal Reviewer for the Czech Science Foundation.

Training/supervision young researchers: I am the main supervisor of 1 PhD (Nicolas Peterson) and 1 Postdoc at DTU Space. I am the supervisor of DTU Fagprojekt project. I supervised 5 Bachelor and 3 Master students in projects in Vaisala China Ltd. and China Industry Research. I supervised 6 student projects and 3 laboratory training for Bachelor/Master students. I am teaching the Master/PhD Lectures "Atmospheric Plasma" (5ECTS) and "Space

Physics" (5ECTS) at DTU Space. I was in the PhD committee of Dr. Sergio Soler López at IAA-CSIC. I was the main organizer of the Atmosphere Physics Seminar (including 30 MSs/PhDs) at NUIST for 3 years. I am the organizer of the Atmospheric physics & Astrophysics Seminar at DTU Space. I led 2 Book Chapters aimed at young researchers and engineers.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | PEDROUSO FUENTES, ALBA |
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| **Título:** | Unraveling hydrolysis for optimizing environmental biotechnology treatment and valorisation processes |

**Resumen de la Memoria:**

At the nexus of environmental biotechnology and cutting-edge research, my research career is dedicated to the development of innovative technologies for resource recovery from wastewater and agri-food waste, exploring the vast potential of biological processes in engineered bioreactors. To address the increasing pressure on natural resources, my research focuses on converting waste and wastewater treatment plants (WWTPs) into biofactories, ensuring water quality, minimizing energy demand, and unlocking the potential for value-added product recovery.

During my PhD, I focused on autotrophic nitrogen removal in the mainstream of WWTPs, which led to the development of the Aquelan technology (EP3255016B1) in collaboration with Aqualia. By inhibiting nitrite oxidising, Aquelan enables nitritation, improving water quality and potentially transforming WWTPs into net energy producers. Adopting an applied-driven approach, I conducted a 3-month international research stay at KTH (Sweden) and a 4-month stay at Aqualia operating different pilot-scale reactors.

As a project manager in the private sector for 1.5 years, I contributed to implementing the first European Indense full-scale plant for enhancing biological phosphorus removal and accumulating biomass to increase WWTP treatment capacity. Beyond wastewater treatment, I delved into carbon recovery from agro-food wastes, leading an antioxidants recovery research line at pilot-scale, enriching my insights into technology development and end-users needs.

In 2021, a 3-year competitive postdoctoral fellowship from Xunta de Galicia facilitated my return to academia, with a 2-year stay research at TU Delft (Netherlands). Leading an independent project, I explored the fundamental science of complex waste fermentation, emphasising carbohydrate hydrolysis, bioenergetics, and microbial interactions. Now, in the third year, this knowledge is applied to agro-food waste valorisation, bridging the theory-application gap.

My research work includes bioplastic production at pilot-scale for industrial wastewater valorisation, showcasing the potential to tailor bioplastic properties and, thus, replacing different types of petrochemical plastics. This will be validated in the recently funded PRETENACC project for technology validation and transfer. Committed to WWTP optimization, I collaborate on scaling-up the Aquelan technology to a pioneer demonstration scale (30 m3).

Attracted by the versatility of phototrophic bacteria and their potential to convert substrates into value-added products with high yields (using energy gained from light), I initiated a photobiorefinery research line focused on carbon and nutrient recovery from wastes, producing protein-rich biomass, bioplastics and/or biohydrogen.

Over the next 5 years, my multidisciplinary approach aims to unlock the full potential of hydrolysis processes in different environments. By integrating hydrolysis with other resource recovery processes (e.g., fermentation or biohydrogen production), my goal is to develop technologically feasible and economically viable solutions for complex waste and wastewater valorisation. This transformative research, conducted in collaboration with end-users, will address real-world challenges in resource recovery like enhancing microbial uptake of fatty wastes, and optimising yields in the fermentation of complex wastes.

**Resumen del Currículum Vitae:**

With a background in Chemical Engineering (2013) and a MSc in Chemical Engineering and Bioprocesses (2014) from Universidade de Santiago de Compostela, my research focuses on developing innovative biotechnologies for sustainable wastewater and waste valorisation. In December 2019, I defended my PhD thesis in Environmental and Chemical Engineering, titled Assessment of the nitritation and anammox processes for mainstream wastewater treatment, including work from lab to pilot-scale, qualified with Cum Laude, international mention and extraordinary award.

My research career has been dynamic, including 1.5 years in the private sector at Cetaqua, where I independently led projects focusing on full-scale phosphorus removal and pilot-scale recovery of antioxidants from agro-food wastes. In 2021, I secured a 3-year competitive postdoctoral fellowship from Xunta de Galicia (ED481B-2021-041), facilitating my return to academia and a 2-year research stay at the Environmental Biotechnology Section at TU Delft (Netherlands). There, I transitioned from engineering to fundamental sciences, broadening my research vision and leading a new research line on understanding complex waste fermentation. There, I co-supervised 3 Bachelor thesis and 3 Master thesis. During this period, I collaborated on 6 projects (2 international, 3 national, and 1 regional) focused on demonstrating biotechnologies for nitrogen removal and biopolymers production (TRL >5). Recently, I initiated a research line on photobiorefinery, emphasising the potential of purple phototrophic bacteria. In this line, I co-supervise 2 PhD theses funded by competitive individual fellowships that I helped conceptualise. Additionally, I co-supervise another PhD on wastewater valorisation by bacteria and microalgae and 7 Master thesis.

I co-authored 28 international JCR papers (81% international and 50% private sector collaborations), an editorial, 3 book chapters, and 39 conference contributions. Emphasising multidisciplinary teamwork and collaboration, a major achievement in my career was the development of the Aquelan technology (EP3255016B1), coauthored by Aqualia, for establishing the nitritation process at mainstream conditions. Aqualia is exploiting it at a demonstration scale in an international project, where I lead the supervision of the demonstration plant operation. Actively engaging with the private sector, I participated in joint research projects (4) and private contracts (5). I am the first author of 10 papers and the corresponding author of 44% of the publications, reflecting my leadership. As part of the research team, I secured funding for pilot-scale projects from diverse sources (Xunta de Galicia, Spanish Research Agency, and Horizon Europe). With 820 citations and an H-index of 13 (Google Sch), my work has gained attention, and my global visibility was fostered by participating in international networks such as COST Actions. I am an engaged member of the international community, I serve on the early career editorial board for Separation and Purification Technology, evaluate project proposals, review JCR articles and conference abstracts, and act as guest editor for a Special Issue of the open-access journal Sustainability. Accredited by ANECA as Profesor Contratado Doctor in 2021. Moreover, I have participated in several events to get research closer to the society.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | SORIANO REDONDO, ANDREA |
| **Referencia:** | RYC2023-043755-I |
| **Correo Electrónico:** | asredondo89@gmail.com |
| **Título:** | Ecología en el Antropoceno |

**Resumen de la Memoria:**

Currently, I am a PI at the University of Lisbon where I am developing my two long-standing research lines: research on animal ecology and conservation, and research on conservation culturomics (the study human-nature interactions through the digital realm). During a MSCA Fellowship at the University of Helsinki (2021-2023, Finland), I studied the magnitude and geographic range of illegal wildlife trade through digital media and the subsequent impacts on biodiversity conservation, combining methods from artificial intelligence, social, and conservation science (in Conserv Lett, PLOS Biol, Biol Conserv, Divers Distrib). At CIBIO (2019-2021, Portugal) I uncovered the effects of food subsidies from humans on the behaviour, migratory strategies, and demography of white storks, showing that new European directives to reduce landfill waste will impact their behaviour and movements. This research has yielded 7 papers (in Ecology, Anim Behav, J Environ Manage, Sci Total Environ, Ibis, Mov Ecol). During my postdoctoral position at the University of Exeter I studied the macroecological processes that govern the relationship between migratory and life history strategies and its consequences for the conservation of migratory species, focusing specifically on birds and mammals (in Nat Commun). I also quantified the role of nature reserves in the population dynamics of a migratory waterbird, providing the first empirical evidence on how demographic rates are influenced by movements between sites with different levels of protection (in PNAS). During my PhD (2014-2017) at the University of Exeter (UK), I studied the population dynamics and dispersal processes of a threatened species in the UK, the Eurasian crane, and assessed the impact of a reintroduction in the population, publishing 4 first-author papers (in Ecography, Anim Conserv, Biol Conserv, and Sci Rep). During that period, I did a research stay at the University of St Andrews (UK) where I developed species distribution models for highly dynamic populations using a Bayesian framework, which resulted in two publications (in Ecography, Methods Ecol Evol). Before starting my PhD, I did two research stays, at CEFE/CNRS (France) and at NIOZ (the Netherlands).

**Resumen del Currículum Vitae:**

I study how animal populations respond to human impacts and the potential mitigation strategies. I have published 35 scientific papers (17 as first or last author), most in Q1 journals (33) and some in high impact journals (e.g., PNAS, Nat Commun., Trends Ecol Evol, PLOS Biol, Front Ecol Environ, and a correspondence in Nature). My h-index (as in Google Scholar) is 15 (14 in WOS), and the total number of citations is 815 (544 in WOS). As a Principal Investigator, I have attracted over €380.000 in funding from two research calls (Marie Skłodowska-Curie Action and Portuguese Foundation for Science and Technology). I have a deep interest in establishing networks and collaborations, which is reflected in the articles I have participated; they include >100 researchers from >20 countries and 4 continents. I have developed research projects at 8 institutions from 6 countries (Finland, Portugal, UK, the Netherlands, Spain, and France).

Overall, I have contributed to multiple presentations (30) at international meetings and have been involved in outreach events. I have participated in 8 research projects, in 5 of them as an associate researcher, one of them being a European Research Council Grant (€1.499.223), and in 2 as PI. I also participate, with 100 researchers from 29 countries, in a European COST Action project (EUFLYNET) to secure the effective conservation of migrant landbirds. My research has been featured in >270 news outlets and I have been invited to interviews on the British radio and television. Furthermore, I have >150 hours of teaching experience in two Master modules at the University of Exeter. Due to my expertise in movement ecology, I co-organised and lectured on this subject in a three-day workshop for PhD students at CIBIO in 2019. I have or I am supervising 1 BSc, 3 MSc, and 2 PhD students from several institutions, and I have been the examiner of 1 MSc, and 2 PhD thesis. I am accredited by ANECA as " Prof. Contr. Dr.". I am an Associate Editor for the Q1 journals Conservation Biology and Ibis. My scientific experience has allowed me to develop expertise on various research fields and be at the forefront of a new field of research, conservation culturomics. My trajectory has taught me to combine knowledge of multiple fields and establish links and collaborations between them.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | OSPINA ALVAREZ, ANDRES ALONSO |
| **Referencia:** | RYC2023-043454-I |
| **Correo Electrónico:** | aospina.co@me.com |
| **Título:** | Multiscale integration in marine connectivity: Bridging individual, ecosystem, and global perspectives |

**Resumen de la Memoria:**

Dr. Ospina-Alvarez is a marine ecologist with 35 peer-reviewed publications. His research centers on ecosystem connectivity, employing dynamic modeling to explore marine biodiversity and human activities. His pivotal contributions advance sustainable marine management and deepen our understanding of ecological resilience. As a dynamic and independent researcher, he leads high-impact projects, and mentors emerging scientists.

Dr. Ospina-Alvarez collaborates across academia and secures substantial funding. He pioneers software tools and web applications for understanding connectivity at ecosystemic, regional, or global scales. Global network of collaborators from extensive international research stays enriches insights into marine ecosystems and conservation.

Recipient of prestigious awards, including the H2020 MSCA fellowship, and recognized for science outreach. Dr. Ospina-Alvarez promotes open science, sharing articles and supplementary data through open access platforms. Committed to public science communication, Dr. Ospina-Alvarez engages in outreach events, open dissemination articles, and maintains a strong online presence and a blog.

Line of Research to be developed
Title: Multiscale integration in marine connectivity: Bridging individual, ecosystem, and global perspectives

Research Focus:
(1)     Individual Scale: Investigates dispersal of marine organisms in NW Mediterranean, using models to simulate transport by ocean currents, uncovering critical patterns in population connectivity.
(2)     Ecosystem Scale: Examines connectivity among various habitats in the Menorca Channel, mapping and characterizing these habitats for ecosystem resilience and biodiversity conservation.
(3)     Socio-Ecological Scale: Assesses seabed habitats in providing ecosystem services within EU sustainable blue economy framework, enhancing understanding of governance of ecosystem services in climate change context.
(4)     Global Scale: Analyzes global seafood trade's connectivity, addressing environmental impacts, food security imbalances, and climate change effects.

Objectives:
(1)     Elucidate marine population connectivity patterns in NW Mediterranean.
(2)     Deepen knowledge of ecological connectivity across seabed habitats.
(3)     Assess role of interconnected habitats in sustaining ecological functions.
(4)     Analyze global seafood trade network and its environmental impacts.
(5)     Synthesize findings into a unified multi-network framework.

Impact:
(1)     Conservation and Fisheries Management: Develops strategies for sustainable marine resource utilization.
(2)     Ecosystem Resilience: Contributes to conservation and restoration efforts, enhancing marine ecosystems' robustness.
(3)     Ecosystem Services: Emphasizes critical role of seabed habitats in policy-making and environmental stewardship.
(4)     Sustainable Seafood Trade: Crafts adaptive strategies to mitigate climate change effects and promote industry sustainability.
(5)     Global Equity: Addresses challenges of resource distribution influenced by fisheries globalization, seafood trade, and climate change.

Innovation: Focus on multilayer connectivity provides a holistic perspective, promising deeper understanding of marine ecosystem complexities.

**Resumen del Currículum Vitae:**

After completing my biology degree at U del Valle, Colombia, I advanced to the U de Barcelona and ICM, earning a PhD in 2012 with a JAE-CSIC fellowship. My career journey included WWF-Med in New Zealand, postdoctoral positions at the Millennium Marine Conservation Centre (2013) and Pontificia U Católica (2014) in Chile. A career highlight was receiving the H2020 Marie S. Curie Action in 2017, leading to my tenure at IMEDEA (UIB-CSIC) since 2018, enriched by a fellowship from the Balearic Islands Government in 2021 and my current role as a Juan de la Cierva contracted scientist since 2022.

My research focuses on connectivity in complex systems, exploring structural and functional connectivity, emerging behavior, and measuring systems' connectivity. I've developed hypotheses on ecological networks, examining topology and centrality to understand ecosystem dynamics and the effects of human activities and environmental changes. Utilizing programming languages like Fortran, Python, Java, R, and dynamic modeling techniques, along with GIS applications, my work combines technical expertise with creative visualization. My studies range from seabird nesting connectivity to biophysical transport of larvae and key invertebrates in the Mediterranean and Humboldt Current System, expanding to trophic webs, benthic habitat connectivity, networks in MPAs, and ecosystem services. My recent work on the global seafood trade network reveals complex links between producer

and consumer countries. My academic contributions include 35 peer-reviewed publications, an H-index of 17, and participation in over 44 conferences. Collaborating with organizations like FAO and WWF, I've contributed to over 15 scientific and technical reports, establishing an international research presence.

My commitment to leadership and mentorship is evident in guiding BSc, MSc, and PhD students from prestigious institutions worldwide. I've coordinated and taught international courses in network analysis and graph theory, contributed significantly to the FONDECYT project in Chile, and participated in EU-funded projects like CERES, FutureMares, and MARBEFES. My role in the EqualSea ERC project as task coordinator and core team member highlights my leadership in scientific endeavors.

I actively contribute to international working groups, evaluating Mediterranean fisheries and participating in groups like ICES WGSPF, WGCOMEDA, and the GFCM FAO-CopeMed II WG on dolphinfish fisheries. Recently, I joined Alimentta, a think tank for sustainable food systems, organized international courses, and evaluated the MSCA program of the EU.

My research, focusing on ecological and socio-economic aspects of globalized natural resources, impacts society profoundly. I assess management strategies for exploited species, collaborating with managers and spatial planners to enhance ecosystem connectivity and service flow. My outreach includes popular articles, a documentary "Larvas las viajeras del Oceano" with over 1450 views, newspaper mentions, and radio interviews. In 2021, I presented my research at the EU Green Day in Brussels.

At the core of my research is a passion for uncovering complex interconnections in marine ecosystems, aiming to enhance ecosystem resilience and harmonize human interaction with nature sustainably in a changing environmental and socio-economic landscape.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | DELICADO IGLESIAS, DIANA |
| **Referencia:** | RYC2023-044935-I |
| **Correo Electrónico:** | didelicado@gmail.com |
| **Título:** | Evolución y conservación de organismos de agua dulce |

**Resumen de la Memoria:**

My research focuses on freshwater biodiversity, systematics, evolutionary biology, morphological evolution, and the factors influencing the rise and fall of species, primarily in gastropods. Using state-of-the-art methods, I integrate DNA, morphological, geographic, and ecological data within Bayesian frameworks to initially delimit species. Subsequently, I address various questions in biogeography and macroevolution, leveraging my integrative findings to assess the conservation status of the involved species. I have meticulously planned my research studies around these topics, formulating testable hypotheses and ensuring alignment with the available resources.

Five key strengths emerge as indicators of leadership potential in my career: 1) Cutting-edge Research: Published 33 articles, with ~45% in top-tier Q1 journals, and ~70% as first or senior author, consistently introducing novel perspectives in freshwater gastropods. One of my first-author articles provides the most comprehensive time-calibrated phylogeny of freshwater gastropods published to date, incorporating DNA sequences from >400 species. 2) International Experience: Worked in three countries, funded by five bodies (~600,000€) over ten years. Led projects funded by the German Science Foundation (DFG), accumulating substantial international exposure. 3) Independence and Leadership: Self-funded career, securing grants like JAE Predoc, Peter Buck Fellowship, and DFG Postdoctoral Grant. Independently of my thesis supervisors, I authored ten of 22 first- and senior-author publications. Co-supervised two master's and two PhD theses. 4) Collaboration and Recognition: Presented work at 17 conferences, including invited talks, and set to deliver a keynote at the 10th Congress of the European Malacological Societies. Reviewed for 15 international journals and invited to international collaborative networks. 5) Academic Engagement: Taught master modules at JLU and Universidad Internacional Menéndez Pelayo, Spain, contributing to social dissemination.

My current investigation aims to assess the contemporaneous extinction risk (CER) of hundreds of freshwater gastropod species (family Hydrobiidae). This involves integrating macroevolutionary, microevolutionary and ecological features through an innovative multifactorial prediction-based method. The proposed investigative lines include: 1) Employing deep-learning methods and integrative datasets to delimit and validate species, utilising morphology, ecology, and DNA sequences. 2) Investigating the influence of environmental and intrinsic factors on diversification across various clades of different freshwater ecosystems using phylogenetic comparative methods. 3) Identifying predictors of CER in the Hydrobiidae, pioneering high-throughput sequencing methods in this understudied taxon and extending the functionality of an R package. The research addresses knowledge gaps in species threats and contributes to safeguarding freshwater resources, particularly focusing on understudied taxa.

**Resumen del Currículum Vitae:**

My scientific contributions have significantly advanced our understanding of freshwater biodiversity and the environmental factors shaping modern and past species. During my thesis at the National Museum of Natural Sciences (MNCN), Spain, I uncovered that gastropod species in springs have lower diversification rates than those in lower river sections. To explore these disparities, I secured three fellowships, constructing a time-calibrated multilocus species tree of Hydrobiidae, the largest family of freshwater gastropods with ~1000 species. This led to nearly seven years as a postdoctoral scientist at Justus Liebig University (JLU) in Giessen, Germany, and the National Museum of Natural History (NMNH), Smithsonian Institution, USA. In these roles, I established a global collaborator network, accessed significant molluscan collections, and gained international recognition. Through collaborations, I compiled information on geographic, morphological, genetic, and ecological aspects for most extant species, defining global hotspots, discovering adaptations, and identifying around 45 new genera and species. I recently published the most comprehensive evolutionary study of freshwater gastropods, based on DNA sequences from over 400 Hydrobiidae species. In the same study, we unravelled hydrobiid subfamily systematics, addressing long-standing questions about the family's origin and diversification patterns. Additionally, I found that morphological structures of freshwater snails undergo diverse rates and modes of evolution, the factors influencing diversification rates in fossil gastropods change over time, and that lake area and depth influence fish diversity dynamics.

My scientific work involves a variety of approaches applied to freshwater diversity. Particularly, I have been skilled at up-to-date analyses in morphology, genetics, ecology, and evolution; the use of inventories (geographic distribution and databases); and conservation assessments for red lists in collaboration with Spanish policymakers and other public environmental agencies. For more than ten years, my research has been conducted in three countries and funded by five different funding bodies (two for doctoral studies and three for postdoctoral research; summing ~600,000€). So far, I have contributed to 33 scientific articles (16 as leading author and six as senior author) in 18 peer-reviewed journals, 15 book chapters and local journal publications, reviewed manuscripts for 15 journals, delivered 20 presentations at national and international conferences (three as an invited speaker), and participated in nine scientific and conservation projects.

I co-supervised two master's and two PhD theses, all of which were completed. Additionally, I have served as a member of evaluation committees for both master's and PhD degrees. My mentoring activities include guiding numerous scientific visitors through the European project SYNTHESYS in optical equipment and assisting foreign students in DNA extraction and amplification techniques. Furthermore, I have contributed to museum exhibitions and taught master modules at both JLU and Universidad Internacional Menéndez Pelayo, Spain. I am recognised in the scientific community as one of the leading experts and am scheduled to deliver a keynote at the 10th Congress of the European Malacological Societies in Crete, Greece.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | DIEZ SARABIA, AIDA MARIA |
| **Referencia:** | RYC2023-044934-I |
| **Correo Electrónico:** | aida-sd@hotmail.com |
| **Título:** | Procesos de oxidación avanzada y de rotura electroquímica del agua para paliar problemas actuales |

**Resumen de la Memoria:**

I am a postdoctoral researcher settled at the Bioengineering and Sustainable research group of the University of Vigo (BIOSUV). During my ten years' experience, I have directed my research towards Advanced Oxidation Processes (AOPs) and electrochemical water splitting reactions, along with the synthesis of catalysts to optimize both processes. Through these methodologies, I propose alternatives to respectively address the excess of pollution and the shortage of energy, areas of current concern. Additionally, I aim to adopt a circular economy approach and contribute to future development through the optimization of both processes and the training of new researchers acting as professor and supervisor.

To begin with, I have optimized AOPs through the synthesis of catalysts, in some cases coupled with adsorption due to the dual activity of the used catalytic adsorbents. Furthermore, I have worked on the optimization of AOP reactors, getting closer to real-world applications by using column reactors and treating larger volumes. I strongly believe that these processes can treat extremely stable pollutants such as plastics, which represent a serious environmental threat. Therefore, I obtained a competitive postdoctoral fellowship from the Xunta de Galicia focused on the degradation of microplastics (and energy generation) for my 2.5-year stay at the International Iberian Nanotechnology Laboratory (INL), resulting in the publication of several articles on the subject.

Thanks to the financial support from the Xunta de Galicia and my stay at the INL, once I returned to my home group (BIOSUV) I started a new research line based on the generation of H2 through electrochemical processes that promote water splitting reactions. However, this process requires the application of high potentials, so catalysts are needed to reduce the costs of implementing these processes. Thus, I have focused on the synthesis of novel and stable materials which catalyze this process in order to enhance the efficiency and reduce the application costs. In fact, I have synthesized environmentally friendly, metal-free catalysts for electrochemical water splitting processes. This line of research is currently my main focus, having attained several publications and securing projects of more than 150,000 € Moreover, I am preparing proposals for Horizon 2020 with the collaboration of various companies, aiming to foster technological development.

Furthermore, I strive to obtain green catalysts for both processes (AOPs and water splitting), avoiding toxic and expensive metals, as well as environmentally harmful synthesis procedures. Therefore, I focus on waste valorisation by using agro-industrial residues, favouring the circular economy, aligning with the Zero Waste principles of the European Commission and reducing the cost of water splitting and AOPs. Additionally, these residues would stop accumulating in land areas that can be used for more profitable purposes. These residues can be used either for the synthesis of catalysts or as catalyst precursors.

During the next years I aim to couple both AOPs and water splitting processes in a sole treatment, making both processes more competitive to their application on real scenarios. This would pose a challenge that I endeavour to accomplish thanks to processes optimization and novel catalyst attaining.

**Resumen del Currículum Vitae:**

Graduated in Chemistry and with a Master's in Chemical Engineering from the University of Vigo, I specialized in Advanced Oxidation Processes (AOPs) for wastewater treatment, leading a research line based on photochemical processes in the Bioengineering and Sustainable research group of the University of Vigo (BIOSUV) since 2014, thanks to my enrolment in several national and international projects. I completed my International Doctorate in 2018, after having obtained a competitive doctoral-professor formation (FPI) scholarship from the Spanish Ministry. This thesis received awards for the best thesis at the University of Vigo, the Campus da Auga, and in the AOPs school. Subsequently, I worked at the International Iberian Nanotechnology Laboratory (2019-2022) thanks to the attainment of a competitive postdoctoral grant of Xunta de Galicia in the formation modality. There, I focused on the electrochemical splitting of water for the generation of H2 as a renewable fuel, attaining high quality publications and a patent that is being evaluated. Back in the BIOSUV group, thanks to the competitive Xunta de Galicia fellowship on the development of my own research line modality, I have created this new line of research based on water splitting processes, so that these processes can be combined with those previously studied (AOPs).

I have obtained 208,406.8 € in research grants, allowing me to continue my desired research career, with more than 3 years of international experience in research centres and universities. I have presented results at 63 conferences (invited speaker in 6 of them), and published 28 scientific articles, 2 book chapters, and I have a patent under evaluation. Half of these publications are in collaboration with international researchers, demonstrating the international character of my research. Moreover, I am the first author in 66.7% of my publications and the second in 30%, being the corresponding author in half of the contributions. This, with the fact that I have directed several researchers (bachelor and PhD) as well as my principal investigator role in various projects highlights my scientific independence. Furthermore, all my publications demonstrate high quality, with 75% being Q1 category and the others Q2. As Principal Investigator, I have competitively obtained 251,108 € with projects funded by national and international entities. I have supervised 7 international doctoral students and directed 8 final degree projects, maintaining an active commitment to teaching and scientific dissemination, forming part of teaching innovative thematic groups and having acted as ambassador of students' conferences or as a bachelor and doctoral dissertation committee. I believe in open science principles, so I have published half of my work in open-access journals and participated in dissemination events such as the CINTECX open days or various scientific stands for the public. All of this have caused my research to gain interest, and consequently I have been interviewed by various newspapers, associations and the radio.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | ALONSO GONZÁLEZ, ESTEBAN |
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| **Correo Electrónico:** | e.alonsogzl@gmail.com |
| **Título:** | Studying Snowpack Dynamics: Bridging Empirical Observations and Numerical Simulations |

**Resumen de la Memoria:**

Most of my scientific career has been focused on improving our understanding of the dynamics of water resources in mountain areas. Given the near absence of in-situ data in snow-dominated regions, I have mastered a number of tools to tackle this challenge. Fieldwork in winter high mountain environments has also been an instrumental part of my work, both for validation and data acquisition. I have generated a large amount of data and software that I have always shared under open licenses, which has helped me establish a strong international presence as evidenced by the diversity of nationalities represented in my substantial list of publications.

My ability to integrate into new research networks, along with my skill set, has allowed me to lead my own research project at the Centre d'Etudes Spatiales de la Biosphère (Toulouse) funded by the French Space Agency, where I worked as a self-funded postdoc. My work was part of the preparation mission of the French-Indian thermal satellite TRISHNA, to explore how we can leverage thermal information to improve simulations and thus our understanding of the hydrological resources. This ambitious goal has been achieved through the development of the first open-source data assimilation tool (MuSA) in collaboration with researchers from various institutions. MuSA has garnered significant interest from a large number of researchers, providing me with international visibility. I recently served as the Principal Investigator on the JASPER project funded by the Norwegian Research Council, which has allowed me to further enhance the tool and strengthen my international network. This year (2023) I have been selected as a Marie Curie and Climate Change Innitiative (European Space Agency) postdoc, presenting two different projects to these extremely competitive calls.

My future efforts will continue focused on the understanding of snow freshwater resources. One of the major challenges in modern hydrology is the near total lack of data in high mountain areas. Snow satellite observation has serious limitations that only provide information on snow cover, but not on its water equivalent or density. In this context, the use of numerical models is widespread, but they have large uncertainties. The key is to integrate available observations with simulations, taking the best from both worlds. This exercise, known as data assimilation, is now more accessible than ever in snow hydrology, thanks to my recent efforts in the development of the open source MuSA tool. However, snow cover observations are limited to areas without tree cover, which are traditionally masked. This makes it impossible to improve simulations in forested areas, and thus study snow water resources in more than 20% of the northern hemisphere. My short-term objectives are to increase our knowledge about the dynamics of snow in forested areas. To achieve this, I aim to study the spectral response of forest landscapes with tree cover, with the aim of obtaining information that can be assimilated using MuSA, and thus generate reliable data that will improve our knowledge of water resources. In the mid-term, my goal is to establish myself as a consolidated scientist, to make a significant contribution to the advancement of snow hydrology. I aspire to lead my own research group, where I can share my passion for science and continue funding my own research

**Resumen del Currículum Vitae:**

I am a Postdoctoral Fellow of the European Space Agency Climate Change Initiative (ESA-CCI) at the Instituto Pirenaico de Ecología (IPE) from the Consejo Superior Investigaciones Científicas (CSIC) in Spain since November 1, 2023. I completed my Ph.D. in Environmental Engineering at Valladolid University in 2020, following a Master's degree in the same field in 2015 (Valladolid University and University of Ljubljana) and a Bachelor's in Forestry and Environmental Engineering in 2013. My research primarily revolves around mountain hydrology, focusing on snowpack dynamics and climatology using tools such as numerical modeling, remote sensing and data assimilation. Moreover, I am actively engaged in fieldwork, having extensive experience in high mountain and arctic environments in Europe and abroad, utilizing various geomatic techniques such as drones or terrestrial laser scanning.

During my previous position in Toulouse (France), I led my own postdoctoral project funded by the competitive call of the French Space Agency (CNES), hosted at the Centre d'Etudes Spatiales de la Biosphère joint laboratory. My work was developed in the frame of the pre-launch activities of the French-Indian thermal infrared satellite TRISHNA, exploring the potential of thermal infrared data to improve snowpack simulations. During this period, I developed the Multiple Snow Assimilation System (MuSA), an open-source data assimilation toolbox, which has garnered international interest and is integral to various research projects and proposals. This includes the JASPER project, funded by the Norwegian Research Council where I acted as principal investigator and where I expanded the capabilities of MuSA.

All these achievements can be proved by my extensive track of records (59 peer reviewed articles, 12 as first authors), and scientific quality metrics (H-index: 17 (Scopus), 20 (Google Schoolar). Citations:807 (Scopus), 1093 (Google Schoolar). My ability to attract funding has been praised by different international agencies, through my recent success in highly competitive postdoctoral calls for proposals. These include the ESA-CCI or the Global Marie Skłodowska-Curie postdoctoral fellows, in addition to the aforementioned CNES fellowship in which I have been successful with different projects, allowing me to fund my research independently.

I've engaged in various scientific communication efforts, appearing in national newspapers like El Pais and on television programs like Informe Semanal. Additionally, I've served as a guest lecturer at several universities, including Eskisehir Technical University, the University of Baleares, and led workshops at Valladolid University. Through these collaborations, I've supervised multiple Master's and Bachelor's dissertations and currently mentor three PhD students utilizing MuSA in their research, while also directing workshops aimed at disseminating cutting-edge techniques to stakeholders, students, and professionals in the field of snow hydrology.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | GUARESCHI , SIMONE |
| **Referencia:** | RYC2023-043685-I |
| **Correo Electrónico:** | s.guareschi@gmail.com |
| **Título:** | Ecology of freshwater ecosystems under global change |

**Resumen de la Memoria:**

My primary research interest can be summarized as: "Ecology of freshwater ecosystems under global change". I use aquatic invertebrates as model systems and indicators of ecosystem functioning and integrity, but I have also successfully utilised riparian species, habitat types and waterbirds in my research previously.

My research has produced important contributions to the scientific knowledge in the emerging research field at the interface of aquatic sciences, applied ecology and invasion sciences with pioneering publications on both invasive and endemic species, at varying geographical scales (regional to global). I combine a diverse set of approaches (from laboratory mesocosms and field observations, to large dataset analysis with millions of organisms and species distribution modelling) while I have widely disseminated my research at international conferences and outreach activities.

After 4 postdoctoral experiences (both in academia and industry, both in Spain and abroad), my scientific portfolio clearly stresses 2 main lines of research: i) Aquatic biodiversity conservation and monitoring; ii) Biological invasions. I gained research independency, an international reputation for rigorous science and I consolidated my position as international leader in the emerging research fields at the interface between applied ecology and biological invasions. It is noteworthy that, according to the scientific platform ResearchGate, my Research Interest Score exceeds that of over 98% of RG members who first published in 2012, indicating a robust upward trajectory and significant potential in my research endeavours. Furthermore, my international leadership in the field is exemplified by my prominence in Google Scholar, where I currently hold the 7th position among the most cited researchers worldwide, under the labels "freshwater ecology" and "biological invasions".

The vast majority of the recent publications has been published open access in hybrid journals of international reputation. Moreover, I am committed to openly sharing data and have made them available in Supplementary materials, specific pages/links (GitHub, OSF) or official repositories.

In the near future, I aim to enhance the field of "Aquatic invasion science" anticipating challenges and exploring emerging concepts and frontiers in our hyperconnected world. An increasingly globalized world, subject to environmental changes, has resulted in an increasing accumulation of non-native species. Biological invasions represent one of the most challenging and exciting aspects of global change and a priority for the long-term sustainable management of freshwater ecosystems worldwide.

Freshwaters and rivers remain less studied compared to terrestrial ecosystems and most theoretical hypotheses developed in invasion science so far have been proposed and tested in terrestrial ecosystems (e.g., using vegetation or vertebrates as model). This does mean there are great research opportunities and gaps that need to be addressed to gain a better understanding of these complex phenomena within freshwater ecosystems (e.g., reasons, mechanisms and implications) to support environmental legislation, protect the environment and help the society.

**Resumen del Currículum Vitae:**

As a freshwater ecologist, I work at the interface of applied ecology, biological invasions, and freshwater ecosystem management. My research aims to provide a rigorous evidence-base to support environmental regulators and offer solutions for the sustainable management of natural resources, whilst protecting the ecological integrity of aquatic ecosystems. To achieve this, I seek to understand the responses of freshwater communities to multiple global change processes across spatial and temporal scales.

After my M.Sc. at Parma University (Italy, 2009) I was awarded with an international mobility grant for young graduates. This offered me the opportunity to join the University of Murcia (Spain) where I obtained a second Master's degree (2011) and started my PhD in "Biodiversity and Environment Management".

After completing my PhD (2015, Department of Ecology and Hydrology), I spent 20 months working in a leading environmental consultancy. This experience helped me acquire a greater understanding of knowledge exchange between academia and industry and enhanced my problem-solving skills.

I have a strong research trajectory, including the successful completion of the highly competitive 'Royal Society-Newton International Fellowship' as main applicant. The project was based at Loughborough University (UK) and led to pioneering publications in top JCR journals on the implications of biological invasions within aquatic ecosystems. During this period (31 months: 2019-2021, £96,500), I coordinated laboratory experiments and led my own research project (scientifically and economically), gaining research independency and developing an international reputation.

In 2021 I was awarded an honorary position as Visiting Fellow in River Science at Loughborough University that facilitates ongoing international collaborations. In November 2021 I joined the Conservation Biology and Global Change Department at Doñana Biological Station (CSIC) where I successfully worked on multiple aspects of biological invasions in freshwaters. I received extra funding (2022-2023) thanks to the Newton Fellowship Alumni (in collaboration with the Environment Agency and Loughborough University) leading the project "Biological invasions in a changing world: reconceptualizing frameworks for a multidisciplinary audience". Recently, in November 2023 I joined the University of Turin (Italy) where I continue my research.

To date I authored or co-authored 54 scientific publications (41 in international peer-reviewed journals; 19 as first or corresponding author). My scientific portfolio indicates 2 main sub-lines of research: i) Aquatic biodiversity conservation and monitoring (23 JCR journal papers); ii) Biological invasions (18). Much of the research I have undertaken has been with international collaborators (>160 certified co-authors from all the continents) and most published in journals in the upper quartile of Ecology.

I am serving the scientific community as member of the Editorial board and Guest Editor of " River Research and Applications" (Wiley), regularly acting as chairperson for international conferences (since 2019) and as invited referee for more than 15 international Journals.

Finally, I hold competitive teaching certifications at the academic level from three different countries (Spain: ANECA, Italy: Ministry of University and Research, UK: Higher Education Academy).

**Resumen de la Memoria:**

For more than a decade, I have pursued an interdisciplinary formation receiving training in three major fields: molecular biology, comparative endocrinology, and toxicology. My research focuses on applying all these skills, together with advanced informatics, to solve problems in the field of marine ecotoxicology. Outcomes of my research career have resulted in 35 scientific publications, 23 of which have been published in journals ranked within the Q1 of their respective areas of knowledge. I have presented 29 communications at international and national conferences, and have written 1 book chapter. Apart from scientific publications and conferences, my research has been disseminated through many press publications. I also developed of two informatic applications among my scientific contributions. Both apps were developed to organize, analyse, and plot data on growth and morphology of sea urchin P. lividus larvae obtained from 48-h embryo-larval tests. I have pursued mobility and internationalization since the beginning of my research career through several international stays and the performance of collaborative work with different groups from around the world. I have worked in 7 academic or industry institutions from 4 countries (total: ~1.5 years of predoctoral and 5.5 years of postdoctoral international stays). This, together with my wide network of worldwide collaborations, support my high internationalization and mobility degree. As a result, 87.5% of my papers are in collaboration with foreign colleagues. My high degree of independence at the laboratory has translated into my involvement in multiple research activities, not only directly related with my PhD or postdoctoral projects but in parallel projects ongoing. This is evidenced in the high number of articles published during these periods (25), 44% of them as first author. At the beginning of my postdoc in the CO-Vigo (IEO-CSIC), I started to develop my own research line devoted to the study of the impact of pollutant mixtures on marine ecosystems under global climate change conditions. Since then, I have been leader of projects from a total of 457.132 € I have co-supervised an undergraduate student to carry out her final degree project and a master student to carry out external lab practises and her final master project. The main goal of my research line is to analyse the impact of global climate change conditions on the effect on the sea and marine life of mixtures of the major pollutant types present in the ocean. I propose to use sea urchin (P. lividus) larvae as an alternative invertebrate model since they are good indicators of the ecosystem status. In this regard, sea urchin embryo tests (SET) have been widely used as a reference method to determine the effect of pollutants in water and sediment samples. To complement the use of alternative models, the integration of artificial intelligence (AI) and machine learning (ML) allows the analysis of results in a reproducible way, suppressing subjectivity and shortening data processing times. Moreover, some algorithms are capable of extrapolating results from assays in invertebrate models to more complex organisms through, for example, molecular data. In this sense, my research line also aims to develop software and standard operating protocols (SOP) that make data analysis from SET reproducible and predictive.

**Resumen del Currículum Vitae:**

My research career started in 2008, when, while coursing the BSc, I joined the group of Dr Bruno at the CEPROVE (Argentina), to work towards obtaining bioactive peptides from whey, providing me with a background in biochemical techniques. In 2013, I started the PhD in Biotechnology and Molecular Biology, at the IIB-INTECH (Argentina), funded by the predoctoral program from CONICET (Argentina). It was focused on the effects of dietary nutrients on fish growth and feed intake, and was defended in 2017 obtaining the highest qualification. During this period, I carried out three stays at the Lab. of Integrative Neuroendocrinology, Univ. Saskatchewan (Canada), funded by ELAP (Government of Canada) and the host laboratory. My research career up to this point provided me with an interdisciplinary formation with training in biochemistry, molecular biology and comparative endocrinology, which I decided to apply, together with advanced informatics, to the field of marine ecotoxicology. My first steps in this field were carried out at the Toxicology Centre (Univ. Saskatchewan), with Dr Hecker who in 2018 hired me as a postdoctoral researcher under a leading project in the field (EcoToxChip) gaining knowledge in toxicology, omics, and how bioinformatics can be applied to study ecotoxicological problems. I carried out an industrial internship at Shell (USA) to demonstrate the EcoToxChip deliverables (RNA-microarrays). Following my postdoctoral stage in Canada, I was granted a Juan de la Cierva Formación contract from the MCIU (Spain) to join the Marine Pollution Group led by Dr Bellas at the Oceanographic Centre of Vigo (IEO-CSIC, Spain), where I have been working to date. My initial research focused on the impact of microplastics on the marine environment using sea urchin embryo tests. In 2021, I was granted a Marie Skłodowska Curie IF, aimed at studying the effect of global climate change, microplastics, and organic contaminants on Paracentrotus lividus. In addition, I am PI of a project from ' Proyectos Estratégicos Orientados a la Transición Ecológica y Digital' (MCIU, Spain) aimed at using molecular markers in sea urchin larvae and artificial intelligence to predict the toxic effects of contaminants. I have been recently granted (PI) a project from the ' Consolidación Investigadora' program (MCIU, Spain), to study the synergistic effects of stress in the context of global climate change.

Overall, my outreach activity comprises 35 scientific publications, 1 book chapter, 29 communications to national and international conferences, and several divulgation activities. As a show of internationalization, I have collaborated with 7 research groups and private entities from 4 different countries, having 32/39 foreign co-authors within my publications. My leadership is supported by my participation in 10 national and international projects, and by having been granted with 6 national and international competitive fellowships. I have also mentored two MSc and one BSc students, and have been assistant professor at the IIB-INTECH. I have been Guest Editor in Front Endocrinol and J Mar Sci Eng, author of an editorial article, evaluator of 2 scientific projects (CONICET, Argentina), and reviewer for 8 JCR journals. I was recently granted with the R3 certificate, which aims to acknowledge quality and independence according to the European researcher profile.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
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| **Título:** | Plant adaptation to environment: basic and applied research |

**Resumen de la Memoria:**

My research seeks to enhance our understanding of the response of plants to environmental pollution with two main overarching goals: (i) monitor the impacts of pollution on the environment; (ii) predict the ecological and evolutionary consequences. My work thus spans two main research lines rooted in the fields of environmental monitoring and plant ecological epigenetics.

I completed my Ph.D. in Biology at the Un. of Santiago de Compostela (USC; Spain; 2010-2015) thanks to 2 competitive fellowships (Xunta de Galicia and Spanish Ministry). The goal of my Ph.D. was to improve the passive moss biomonitoring technique used in environmental monitoring programs worldwide to estimate the atmospheric deposition of heavy metals (HM). I made significant contributions to the field by identifying major limitations to the use of this technique and proposing measures to overcome and/or minimize them. I performed 2 stays abroad (Italy and USA; 7 months total) to expand the focus of my research an apply classic molecular tools to assess the impact of pollution on the genetic structure of natural plant populations.

In 2016, I initiated my own independent research line aimed at uncovering the genetic and epigenetic basis of adaptation and evolution in bryophytes. For this, I launched the Marie S. Curie project BRY"O"MICS. As an MSC Fellow, I moved to the Univ. of South Florida (USF; USA; 26 months between 2016-2018), the Univ. of Vienna (UV; Austria; 2 months in 2018) and the Estación Biológica de Doñana (EBD-CSIC; Spain; 10 months between 2018-2019) where I got intensive training in the use of cutting-edge molecular tools (lab and bioinformatics analyses), and scanning electron microscopy to answer my research questions. I found that bryophytes show non-genetically based intraspecific differentiation for HM tolerance and that epigenetic regulation of gene expression could underlie such differentiation. I also found sexual dimorphism for HM tolerance in bryophytes, and I am currently studying its molecular basis. During this period, I also developed my own (inter)national collaboration network that allowed me to delve into the study of the role of (epi)genetic variation in plant adaptation in a broader plant group.

I continued my work in the field of plant evolutionary ecology as a Juan de la Cierva-Incorporación Fellow at EBD-CSIC while still collaborating with my previous lab at USC on applied ecotoxicology and bryophyte reproductive biology.

Currently, I hold a Maria Zambrano Fellowship at USC that allowed me to start a project on the impact of sublethal effects of HM on plant population fitness. Last year, I gained a José Castillejo grant to perform a 6-month stay at the Swedish Natural History Museum (Stockholm) and a 3-year research project from the Spanish national "Generación del Conocimiento" call.

My scientific trajectory so far has been impeccable since I have successfully accomplished each and every single milestone of the scientific career in Spain. The Ramon y Cajal contract thus constitutes the next natural step towards my stabilization and the perfect vehicle to establish the PlantAdapt laboratory and continue to expand my research on the effects of pollutants on individual plants' fitness, population fitness, and ultimately, ecosystems functioning. Winning this contract will finally allow me to establish my own independent laboratory.

**Resumen del Currículum Vitae:**

Overall summary of merits: (1) 37 peer-reviewed publications with 905 citations (Google Scholar): 33 in international SCI journals (81% in Q1; 32% of these in D1; 1st and corr. author in 52% and 1st author in 55%); 2 book chapters (both as 1st author); 2 in national SCI journals (both as senior author; one In Press). (2) 9 competitive research projects: 4 international (1 as PI); 5 national (1 as PI and 1 as CoPI which is ongoing and was awarded in the last "Proyectos de Generación del Conocimiento" call from the Spanish Ministry of Science Innovation and Universities); 1 autonomic. (3) 4 R&D contracts: 2 with public entities; 2 with private entities. (4) 9 individual competitive research grants/contracts (total = 488,676€): 4 as postdoc (3 contracts – Marie S. Curie 2015, Juan de la Cierva Incorporación 2018, María Zambrano 2021-ongoing – and 1 stay abroad – José Castillejo 2022-ongoing); 5 as predoc (2 contracts – Xunta de Galicia 2008, FPU 2009 –, 2 stays abroad – FPU 2012, Fundación Barrié 2013 –, and 1 to collaborate in research activities at USC – Xunta de Galicia 2008). (5) 5 research stays abroad (total = 3.4 years): 3 as postdoc (USA – 26 months, Austria – 2 months, Sweden – 6 months); 2 as predoc (Italy – 3 months, USA – 4 months). (6) 17 contributions to conferences: 4 national (3 talks, 1 poster); 13 international (9 talks - 1 invited & 1 best postdoc talk award -, 4 posters). (7) 5 scientific event organizations: 1 international conference; 3 international symposia; 1 national meeting. (8) 14 service provision activities: 1 time External Project Reviewer for the French National Research Agency (ANR; 2023); 1 time Member of the committee of evaluation of the final degree projects (TFG) defended at the Faculty of Biology (USC; 2023); 1 time Member of the committee of evaluation of the Doctoral Thesis defended by Dr. Sofía Debén García at USC (2018); 5 times representative of non-permanent assistant professors and research trainees at the USC (ongoing); review editor for 3 international SCI journals (ongoing); 3 times Cash Auditor for the International Molecular Moss Science society (iMOSS; 2019-2021). (9) 379 h of officially certified teaching: at Univ. de Santiago de Compostela and Univ. de Sevilla. (10) 12 mentored students: 1 PhD student (co-supervised); 11 Biology degree students (TFGs; 2 ongoing). (11) 4 academic distinctions: I3 certificate (AEI, Jan. 2023); Prof. Contratada Dra., Prof. Ayudante Dra., and Prof. de Universidad Privada (ANECA, Sept. 2015); (12) 12 science outreach activities to society: "STEMbach" and "A Ponte entre o Ensino Medio e a USC" programs at USC that involve high school student mentoring and scientific talks at secondary and high schools (2022-ongoing); hands-on workshops at primary schools within "International day for women and girls in science" (11F, 2020-2021) and at the European researchers Night (2018, 2020).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
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| **Título:** | Estudio del Campo magnético terrestre pasado y presente |

**Resumen de la Memoria:**

Mi trayectoria científica se basa en el estudio del campo magnético terrestre en el pasado y en el presente. Empecé estudiando el campo magnético de origen interno utilizando datos paleomagnéticos de los últimos 3000 años. Desarrollé un modelo de campo geomagnético llamado SHAWQ2k que fue el primero en incluir un esquema de pesado basado en la calidad del dato, y lo usé como parte de mi tesis doctoral para estudiar la emergencia y evolución de la Anomalía del Atlántico Sur, una de las características más interesantes del campo actual. También durante mi fase predoctoral inicié un estudio en el que, haciendo uso de una herramienta llamada transfer entropy, se analizaba la posible conexión entre el campo magnético y el clima en el pasado. En mi fase postdoctoral me centré más en la evolución del campo magnético en el presente y continué mi estudio de la Anomalía del Atlántico Sur, esta vez haciendo uso de datos de la constelación de satélites Swarm de la ESA. Así empecé también a interesarme por la ocurrencia de jerks geomagnéticos y su posible relación con esta anomalía. Gracias al manejo de los datos magnéticos de los satélites Swarm, empecé a desarrollar una nueva línea de investigación sobre el estudio de la fase de preparación de fuertes terremotos y el acoplamiento entre litosfera-atmósfera-ionosfera (LAIC). Se estudió desde dos puntos de vista: el primero caso por caso realizando estudios individuales a terremotos diferentes; el segundo desde un punto de vista global, haciendo uso de un análisis de correlación estadístico mundial. La importancia de estos estudios es clara, ya que si se logra establecer un mecanismo o una cadena de fenómenos que preceden a ciertos terremotos, la gestión de la alerta podría desarrollarse con mucho más tiempo y evitar daños e incluso muertes.

Continué mi carrera profundizando en los temas antes mencionados y abriendo una nueva línea con la aplicación del estudio de los datos magnéticos de satélite a áreas volcánicas activas. La relevancia de este estudio es que se integraba la información proporcionada por los datos magnéticos con otras fuentes de datos, como los gravimétricos de satélite. Estudié otros datos de distintos satélites: CSES, Grace, Cryosat-2, Champ. Esto me dio una perspectiva mayor de las limitaciones que este tipo de integración de datos podía tener y nuevos retos para resolverlas.

En la actualidad continúo con el estudio del campo magnético de origen interno, analizando variaciones bruscas y posibles periodicidades del mismo que den pistas sobre su posible evolución futura; sigo con el estudio del LAIC, intentando ir un paso más allá con la aplicación de la ley empírica de Rikitake, que relaciona el tiempo de antelación de un precursor y la magnitud del terremoto; y continúo con la aplicación de los datos magnéticos de satélite a estudios sobre áreas volcánicas. Como líneas de investigación futuras, en las que he empezado a trabajar recientemente, destacar dos: la primera relacionada con los estudios de la ionosfera haciendo uso de estaciones GNSS y digisondas, especialmente durante tormentas geomagnéticas moderadas y sobre el sur de la Península Ibérica y norte de África; la segunda es la aplicación del machine learning o aprendizaje automático al estudio del campo magnético actual para intentar predecir su comportamiento futuro.

**Resumen del Currículum Vitae:**

Terminé mis estudios de Bachillerato con una mención de honor que me permitió asistir a la Universidad Complutense de Madrid (UCM) con la matrícula del primer año pagada. Realicé la Licenciatura en Física en 5 años y durante el primer año obtuve la Beca de Excelencia del Ministerio de Educación y Ciencia que me permitió colaborar durante 50 horas dentro de un grupo de investigación en la UCM. Elegí el grupo PalMA y, bajo la supervisión de la Dra. Montoya Redondo, realicé el trabajo titulado "Análisis de simulaciones climáticas de los últimos mil años realizadas mediante un modelo acoplado de atmósfera-océano de complejidad intermedia". Este fue mi primer contacto con la investigación. Después de la carrera, hice el Máster de Geofísica y Meteorología en la misma universidad y un Trabajo Fin de Máster en Geofísica, sobre la evolución del momento dipolar del campo geomagnético y aplicaciones a la Paleoclimatología. Siguiendo esta línea de investigación, y gracias a una beca de Formación de Personal Investigador (FPI 2012, 2 años de beca y 2 de contrato), empecé mi doctorado en Física, el cual terminé en febrero de 2017 con mención internacional y calificación Cum Laude. Durante mi tesis realicé 2 estancias en el Istituto Nazionale di Geofisica e Vulcanologia (INGV) de Roma (Italia) de más de 6 meses en total, y una estancia en la Université de Rennes (Francia), de 2 meses. Al terminar el doctorado conseguí un contrato postdoctoral en el INGV asociado al proyecto TEMPO, del que fui investigadora principal (IP) durante un año. Este proyecto estaba vinculado a una Living Planet Fellowship de la Agencia Espacial Europea (ESA) que ganó Dr. F.J. Pavón Carrasco. Después de un año como IP, la tuvo que dejar y mi CV fue evaluado por la ESA, aceptado y así pude continuar el año restante como IP. Después me renovaron el contrato asociado a los proyectos LIMADOU, de la Agencia Espacial Italiana en colaboración con la China National Space Administration, y e-SAFE, de la ESA. Después de 2 años y 4 meses en Roma volví a España con un contrato Juan de la Cierva Formación asociado al Instituto de Geociencias (IGEO-CSIC) y en el que estuve 2 años y 3 meses (pandemia incluida). En mayo de 2022 comencé un nuevo contrato Juan de la Cierva Incorporación en la UCM, donde me encuentro en la actualidad. He participado en los congresos más relevantes en el área de la Geofísica, he publicado mis trabajos en revistas de alto impacto, la mayor parte en Open Access, he puesto a disposición de la comunidad dos modelos de campo geomagnético que he generado a lo largo de estos años a través del repositorio público ERDA. He participado o estoy participando en 17 proyectos, 2 de ellos como IP. Fui Guest Editor en 2 Special Issues en Remote Sensing y Frontiers in Earth Science. De 2020 a 2023 fui representante de Early Career Scientists en la División de Earth Magnetism and Rock Physics en la Unión de Geociencias Europea, y ahora soy Science Officer. He co-supervisado 5 trabajos de Fin de Máster, 3 trabajos Fin de Grado (1 en Italia) y 3 prácticas en empresa en mi etapa en el IGEO. He sido co-directora de la tesis doctoral de Dra. A. González-López (FPU) y estoy actualmente co-dirigiendo a M. Puente-Borque (FPI) y a M. Serrano (Com. Madrid). Participo en actividades de divulgación y soy una de las fundadoras del plan de divulgación del grupo de Paleomagnetismo UCM.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
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| **Título:** | Venómica de invertebrados marinos |

**Resumen de la Memoria:**

My research is centered on the evolutionary biology of marine invertebrates, in particular annelids, mollusks and nemerteans. I have specialized on integrative taxonomy, systematic phylogenetics, comparative transcriptomics and proteomics, with expertise in morphological and histological analyses. Currently, my research focuses on the mechanisms that originate novel convergent traits in distant evolutionary lineages, using venomous marine invertebrates as model systems. My career began at Universidad Autónoma de Madrid (Spain), with a BSc in Biology and MSc in Biodiversity. I focused on annelid biodiversity and systematics and acquired fundamental skills such as integrative taxonomy and molecular phylogenetics. I continued with a PhD in Evolutionary Biology at the City University of New York (USA) focusing on the molecular mechanisms underlying bioluminescence and venom production in annelids, two convergent traits evolved repeatedly across metazoans. I gained skills in comparative genomics and transcriptomics, proteomics and evolutionary bioinformatics, defending my thesis in 2018 with Excellent Cum Laude. My research contributed to the venomics and evolutionary biology fields revealing a great diversity of venom compounds in poorly known marine invertebrates and adding to increasing evidence that convergent phenotypes result from similar molecular mechanisms showing that the genetic makeup of different annelid and mollusk venoms are highly similar. After my PhD, I was awarded a Marie Skłodowska-Curie Individual Fellowship (MSCA) to work at the Natural History Museum (UK) within Dr Ana Riesgo to investigate venom evolution in ribbon worms. I gained experience in gene expression analyses and histological techniques, and my project was the first to combine RNAseq gene expression, tandem mass spectrometry proteomics (MS/MS) and MALDI imaging mass spectrometry (MALDI-IMS) to identify and characterize novel toxins in a venomous organism without a multicellular venom gland. The combination of these techniques allowed us to identify novel nemertean toxins and revealed that ribbon worms produce functionally distinct venom cocktails for predation and defense. This groundbreaking work was recently highlighted by Nature. By implementing MALDI-IMS in my work, I quickly recognized that spatial methods had the potential to revolutionize the venomics field, so I decided to apply Spatial Transcriptomics (ST) to venom research. I obtained an EMBO Short Term Fellowship to work at SciLifeLab (Sweden) with Dr Stefania Giacomello, where I received training in experimental and bioinformatic protocols to analyze ST data, and I optimized the method to explore spatial gene expression patterns on nemertean and annelid tissues. In 2022, I received a Juan de la Cierva Incorporación Fellowship to work at the Museo Nacional de Ciencias Naturales (Spain) giving me the opportunity to further develop my interest in marine invertebrate venomics and spatial omics, expanding my research to other venomous animals like cone snails (Mollusca) and sea urchins (Echinodermata). Ultimately, I am now at a point in my career where I am ready for the level of independence that a Ramón y Cajal Fellowship would provide. It represents an exciting opportunity to establish my own independent venomics laboratory and expand my science to contribute to the scientific community.

**Resumen del Currículum Vitae:**

My research is centered in the diversity and evolution of marine invertebrates and the processes that originate novel convergent traits such as venom and bioluminescence. I use different methods including genomics, transcriptomics, proteomics, molecular evolution, phylogenetics and morphology to answer questions such as whether the same genes underlie convergent traits in unrelated organisms, or how novel features originate and what is their impact in species diversification and lineage evolution. questions. I am currently investigating the molecular mechanisms that originate complex convergent traits in distant evolutionary lineages, using venomous annelids and ribbon worms as model systems. Derived from this research I have produced 32 scientific publications (24 peer-reviewed articles, 3 preprints, 1 book and 2 chapters, and 2 technical reports), with a total of 428 citations (h=11, i10=11, Google Scholar), including papers in Molecular Biology and Evolution, eLife and GigaScience among others. I have published 70% of my papers as first, second or senior author, and the rest as middle author, showing a high degree of leadership and independence. I have participated in 16 research projects, 5 as PI o co-PI, obtaining over 270,000 euros in funding with the latter. I have disseminated my work through 50 contributions in national and international conferences, being invited or keynote speaker in 4 occasions, and receiving 4 awards for best communication, including a recent Early Career Researcher Award. I have ample experience in higher education, with over 800h of teaching (~500h in EEUU) at bachelors and masters levels, 2 innovative teaching projects and supervising 13 students: 2 PhD theses (ongoing), 4 Master's, 1 JAE-Intro and 7 Bachelor's theses. I regularly contribute to editorial and reviewing processes, serving as referee for 10 international journals, and being on the Editorial Board of the journals Toxins, Venoms and Toxins, and Graellsia. I have also served as expert evaluator for research projects for the European Commission Horizon Europe - Marie Sklodowska-Curie Actions Postdoctoral Fellowships program, the Argentinian National Agency for Technological and Scientific Promotion and the Norwegian Research Council. My international collaboration capacity is extensive, with research stays in prestigious institutions such as Science for Life Laboratory (Sweden) and Scripps Institution of Oceanography (USA), and currently serving in the Management Committee of the European Venom Network (EUVEN) financed by COST Association, and recently elected to serve in the Executive Board of the Spanish Society of Evolutionary Biology. I have also participated in the organization of three international conferences, including a prestigious Gordon Research Conference on Venom. I am committed to science communication and have organized and participated in numerous outreach activities including the 2021 European Researcher's Night at Museo Nacional de Ciencias Naturales (Madrid), Venom kills, but can it cure? Live Talk and Quiz at the Natural History Museum (London), several workshops at the American Museum of Natural History (New York), numerous outreach articles and a children's book.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
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| **Título:** | Machine Learning for Monitoring and Understanding Vegetation Ecosystems From Space |

**Resumen de la Memoria:**

I started my research journey in 2007, specializing in image processing and honing my technical and analytical skills. At the University of Valencia, I secured a research assistant position, contributing to regional and global-scale projects (DULCINEA and LSA-SAF) utilizing NASA MODIS, ESA MERIS, and EUMETSATt Meteosat platforms. As a Ph.D. student, I optimized land vegetation photosynthesis estimates for Spain, surpassing NASA's operational algorithms. Recognized as the most outstanding graduate in Remote Sensing and awarded for my thesis quality, I solidified my expertise.

Post-Ph.D., I joined the University of Montana NTSG (2015-2020), a NASA Earth Science Information Partner, where I actively proposed and carried out improvements and changes to key operational algorithms, contributing to NASA' s monumental Earth Observation (EO) MODIS initiative. Collaborating on pioneering projects, I led the creation of global high-resolution maps of plant functional traits and novel operational high-resolution carbon fluxes estimation products for the conterminous United States.

In 2018, I returned to Spain as a senior researcher, contributing to an ERC Consolidator grant project (SEDAL) at the University of Valencia's Image and Signal Processing (ISP) My scientific influence expanded globally, leading to publications in esteemed journals (including Science and Nature), participation in NASA project reviews, and collaboration with prominent organizations. Recognized as an established researcher (R3), a member of ELLIS, Europe's largest AI network, IEEE, and awarded as a Google Developer Expert in Earth Engine, I continue my impactful work in an ERC Synergy Grant (USMILE), focusing on high-resolution ecosystem functioning indicators and advanced statistical inference methods. I have advised 4 Master's Theses and currently co-advising 3 Ph.D. theses in the ISP group. Simultaneously, I serve as PI and Co-PI in four International projects GEELAND, HERMES, THINKINGEARTH, and AI4PEX, spearheading remote sensing data characterization, ecosystem model creation, and simulation activities.

**Resumen del Currículum Vitae:**

The dynamic global maps of the atmosphere, oceans, land, biosphere, cryosphere, and human-built environment have transformed our understanding of the Earth and allowed us to model it as a whole. Leveraging machine learning (ML), I have contributed to detecting and analyzing intricate relationships within vast Earth system datasets. Throughout my career, I have focused on applying and refining ML methods to generate essential climate variables and detailed models, pivotal for monitoring and comprehending fundamental Earth system processes influencing climate change. My main scientific achievements are:
-Development of the first optimized daily photosynthesis model. My thesis was awarded for its outstanding quality and yielded numerous high-impact publications.
-For five years, I have been part of a NASA Science team maintaining, proposing, validating, and implementing operational algorithms for Earth Observation.
-I led research for global maps of plant functional diversity information to understand better and monitor the land biosphere (e.g., published in Remote Sensing of Environment and Nature Ecology & Evolution).
-The nonlinear vegetation index we created in 2021 (published in Science Advances) allows more accurate terrestrial carbon source/sink dynamics measures.

As an R3 certified researcher (2023), my research network includes more than 100 worldwide experts in key institutions and space agencies, mostly from the US and EU. I do high-impact research (32 Q1, h index of GS:25, WoS:21, more than GS:3400, WoS:2400 cites), have written four book chapters, and have participated in more than 80 international conference presentations. I teach at the University of Valencia in the Remote Rensing master and Data Science degree. I am a PI & Co-Principal Investigator in four international projects (GEELAND, HERMES, AI4PEX, ThinkingEarth). I have advised 4 Master's Theses and currently co-advising 3 Ph.D. theses in the ISP group. Google has awarded me the Google Developer Expert recognition. Most of my developments are available on GitHub,

and the datasets are openly available in Zenodo, Google Awesome Datasets, or the official institutional channels (e.g., TRY, ESA, NASA). Moreover, I also create front ends and tutorials in Google platforms for the general use of our results.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | RUIZ FRAU, ANA |
| **Referencia:** | RYC2023-045373-I |
| **Correo Electrónico:** | aina.ruiz@gmail.com |
| **Título:** | Marine and Coastal socioecological systems |

**Resumen de la Memoria:**

I am an interdisciplinary researcher working on the nexus of social sciences and ecology. I investigate the relationships between people and the sea, especially regarding values, knowledge and institutions.

I did my PhD in the UK, funded by a highly competitive scholarship (NERC-ESRC) at Bangor University. My PhD focused on the valuation and integration of social, economic and ecological values to guide coastal management. After my PhD in 2011, I worked for the Countryside Council for Wales (Welsh Government Agency) within the framework of an EU project aimed at achieving sustainable fisheries through the integration of fishermen's knowledge. For these 2 years, my career moved from an academia focus into the application of science to management. After this period, I had a 2 year maternity career break. I spent 4 years outside research before returning to academia in 2014 as a postdoc at the IMEDEA working on the EU FP7 project OPERAs, which focused on the operationalization of the ecosystem services (ES) concept. I worked on the integration of socio-cultural valuations into management.

In 2015, I was awarded a Marie Sklodowska-Curie Action (JellyPacts), on the social and economic impacts of jellyfish which I undertook part-time due to childcare. Since re-entering academia in 2014, I have established myself as one of the few researchers working on marine SES and ES in the Mediterranean area. I have developed strong collaborations with the ES community, and I have led several ES conference sessions. I have been appointed co-chair of two international working groups (Marine and Mediterranean) within the ES Partnership. I am part of the Iberoamerican network on ES & MPAs ECOMAR. I am also member of the EU COST Action-Ocean Governance for Sustainability and the ICES WG on Resilience and Marine ES and of the PathGrass EuroMarine Action.

In 2019, I was awarded a Juan de la Cierva Incorporación Fellowship. In September 2021 I was appointed Task Leader in the H2020 EU funded FutureMARES project, where I am leading a global ecosystem service climate risk assessment for nature based solutions, involving over 20 partners. I am also part of the EU MARBEFES Horizon Project. Recently, I have won a competitive project as Principal Investigator in a La Caixa Foundation call (success rate 4%) where I am leading a team of 5 researchers from different institutions. I am also PI for the CSIC in a HORIZON MSCA DN.

My research at the frontier between the environment and society has provided me with very valuable and differentiated skills from those present at the research groups where I've worked with.

My main line of research focuses on the study of marine and coastal social-ecological systems (SES); how change and interactions shape the relations between society and the environment. I study these interactions using an ecosystem service and a nature contributions to people framework focusing on assessing plural values, views and social perceptions, and integrating those into management to achieve sustainability. My dual training as a marine ecologist later moving into the social dimensions of marine and coastal systems has provided me with the necessary knowledge and tools to understand and analyze SES in a holistic manner, integrating the ecological and social dimensions of these complex systems.

**Resumen del Currículum Vitae:**

My research is on socio-ecological systems (SES); how change and interactions shape the relations between society and the environment, and the integration of plural values into management to achieve sustainability. I did my PhD at Bangor University. During my career, I've made several contributions to field of SES. I've published pioneering works on spatial sociocultural valuations (SCV) of marine ecosystem services and their integration into management. I have published studies on the operationalization of the Ecosystem Services (ES) concept and in bridging the gap between ecological and ES dimensions. I have developed novel methodologies combining social media data and graph theory analysis to uncover cultural ES in coastal areas. My level of independence and leadership is reflected in my track record of funding and grant capture from different national and international institutions, among them a highly competitive PhD fellowship funded by the UK Research Council, an MSCA fellowship, a Juan de la Cierva-Incorporación, and a project as PI which I recently won in a highly competitive call (4% success rate). My level of internationalization is very high, with 122 authors from 25 countries. I'm a member of multiple international networks and WGs that I belong to or chair, and I've led multiple sessions at international conferences. I'm Task leader in the EU FutureMARES project, coordinating 20 partners in a Climate Risk Assessment for ES. The levels of productivity, impact, leadership and independence that I've achieved are particularly remarkable considering that I experienced a career break of over 5 years due to childcare. I contribute to the scientific community and the mentoring of students. I am a reviewer of scientific journals (e.g.: ICES Journal of Marine Science, Ecosystems & People, Ocean and Coastal Management, Society & Natural Resources, Ecosystem Services). I'm an evaluator of Research Grants for the German Academic Exchange Service and La Caixa Foundation. I have been invited as an international and national PhD evaluator (Wageningen University; The Australian National University; Universidad de Vigo). I have co-led 2 national and international courses on Graph Theory Network Analysis (2019; 2020). I have been an invited lecturer at International Master's Programme in Environmental Studies and Sustainability Sciences in Lund University. I have supervised 2 TFG and 1 TFM and 4 Erasmus+ internships and 1 PhD candidate. I am PI for recently awarded MSCA-Doctoral Network and PI of a national project.

Summary: 30 peer-reviewed articles, of which: 27 in Q1; 1st author of 11 (44%); 19 articles > 20 citations, 10 articles > 50 citations. 1 single author publication. Total citations = 1100 (Scholar); Author of 2 book chapters and 10 scientific/technical reports; h-index = 18; Independent researcher = 80% publications without PhD supervisors; 122 international co-authors from 25 countries; Lead of 2 international ecosystem services (ES) working groups within the ES Partnership (Marine and Mediterranean); Member of 7 international networks and WG; Chair of 7 int. conference sessions; Stays at international research institutes: Bangor University (UK), Marine Biological Association of the United Kingdom, University of Queensland (Australia).

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | BERTRAND , ORNELLA |
| **Referencia:** | RYC2023-042630-I |
| **Correo Electrónico:** | ornella.bertrand@icp.cat |
| **Título:** | Investigadora postdoctoral 'Beatriu de Pinós' |

**Resumen de la Memoria:**

My main goal for the duration of this grant is to answer the fundamental question of the emergence and evolution of the mammalian sensory toolkit and tease apart the influences of ecological and environmental factors from phylogeny. Today, mammals exhibit an incredible range of morphological and sensory adaptations tightly related to the specific ecological niches that they occupy. How this sensory diversity emerged in mammals is currently unknown. Although highly challenging to study, understanding the complex interactions among senses can provide critical information about how the sensory system of mammals evolved as a whole. The aim of my project is to determine how rich sensory behaviours emerged in mammals over geological time, by identifying the evolutionary steps leading to them including the drivers, timing, and rate of change. I will reach this goal by achieved four objectives: (i) generating a large dataset of brain, inner ear, and nerve virtual endocasts for extant and extinct mammals; (ii) characterizing the relationship between sensory proxies and ecological adaptations in extant mammals, notably through the determination of novel behavioural quantitative variables; (iii) establishing when and how fast major sensory shifts occurred and how senses interacted with each other throughout mammalian evolution in relation to ecological adaptations; and (iv) elucidating the role of environmental changes on the evolution of sensory ecology in mammals throughout geological time. This will provide significant insights into the environmental and ecological impacts on sensory interactions and whether certain senses co-varied and show trade-offs with morpho-ecological innovations through deep time and in relation to environmental changes. Through this, it may become possible to predict the senses that lead to better chances of survival and help conservation effort to protect species living in collapsing ecosystems. The methodology could be an exemplar to understand the sensory evolution of other animals such as understanding of the evolutionary success of birds. This project will also provide a framework to estimate senses in extant species for which soft tissues are not preserved or available. Ground breaking and innovative aspects of the projects include 1) the combination of all known senses to understand how senses evolved through time in mammals, 2) the inclusion of the fossil record in determining the emergence and diversification of all sensory interactions and their relation with ecological adaptations, 3) a new ecological categorization for locomotor behaviour more in line with the senses, 4) the largest dataset of endocranial sensory proxies for mammals, 5) the direct and indirect effects of the environment on sensory ecology in mammals, 6) testing whether and which combination of senses may have had a role in the adaptive radiation of mammals, 7) a framework to use senses to predict extinctions based on their association with ecological adaptations and environmental conditions. This work could be 1) used to identify species that could become vulnerable to extinctions if the ecosystem in which they live collapses in the future, 2) serve as an exemplar methodology to understand the sensory evolution in other animals and 3) be a way to estimate senses in species for which soft tissues are not preserved or available.

**Resumen del Currículum Vitae:**

I am a paleontologist and evolutionary biologist specializing in paleoneurobiology. My focus is on the evolution of the neurosensory system of mammals and I have become one of the leading experts in the field with an interdisciplinary approach bringing together paleontology, neurobiology, and sensory ecology. Throughout the years, I have developed valuable skills in processing CT data and generating 3D models of endocranial structures. I use cutting-edge phylogenetic comparative methods to study when and how fast, senses have changed throughout time in mammalian evolution. I was awarded the Annette Kade Fellowship at the AMNH in New York (2010) to continue my Master's work (2009) on rodent dental anatomy. During my PhD (fully funded, defended in 2016) and first postdoc at the University of Toronto, I focused on the neurosensory evolution of rodents. Then, I was awarded a Marie Skłodowska-Curie Individual Fellowship at the University of Edinburgh (2018-2020) to expand my research to study the senses of early placental mammals. At the same institution, I was part of a team that investigated the origin and early evolution of placental mammals (2020-2022). Then, I was awarded a Beatriu de Pinós–MSCA COFUND fellowship at ICP (2023-present) where I focus on the evolution of sensory ecology. I have a strong publication record including some articles which broke new ground in mammalian research for their use of endocasts and CT data (e.g., Science, Communications Biology). I have 24 publications including 22 peer-reviewed articles (12 first author; Q1: 21). I have 51 published abstracts including 3 as senior author, and 21 as first author. I have 505 citations and an H index of 14 (Google Scholar, 31/01/24). I have participated in 50+ conferences and been invited to present my research 18 times at symposia and leading institutions worldwide. I am a co-PI on a project with the University of Bordeaux for which we obtained 4,000€ to study the impact of seasonality on the brain mammals. I applied for an ERC StG in 2022 and would have been funded if funds were sufficient. In 2023, I applied for an ERC CoG with the same project. Recently, we obtained 10,000€ for an international project aiming at studying the brain using an integrative approach. As a postdoctoral researcher, I was part of an ERC StG (756226) and NSF (1654949) projects that aimed at disentangling the relationships of early placental mammals. For my dissertation work, I obtained two student awards: Best Student Article and Best Student Presentation. So far, I obtained 10+ grants (>12,000 €) to visit museum collections, attend workshops and conferences. From 2013 to 2017, I taught undergraduate level courses on primate evolution, human origins, and introductory biology at the University of Toronto and Santa Monica College (USA) and in 2023, two Master level courses on mammalian origin and diversification at the ICP. I have been or still am the main supervisor or co-supervisor of 9 students (Undergraduate, Master and PhD levels). I have peer-reviewed 60+ manuscripts in Paleontology, Evolution, and Mammalogy. I am an Associate Editor for the Journal of Mammalian Evolution. I have performed 20+ interviews on my research via the radio, podcasts, and magazines for the general public. I was featured in three documentaries (2023-2024) on the end-Cretaceous extinction and the Ice Age Megafauna.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | MAZA MARQUEZ, PAULA |
| **Referencia:** | RYC2023-045828-I |
| **Correo Electrónico:** | PAULAMAZA@UGR.ES |
| **Título:** | Ecology of mixed microbial communities in engineered systems for industrial/urban wastewater |

**Resumen de la Memoria:**

My main research line focuses on the characterization of mixed microbial communities (bacteria, archaea, fungi and microalgae) in engineered systems aimed to treat urban/industrial wastewaters (WW), with particular emphasis on the monitorization of population dynamics in response to operational variables. This approach provides insight on the key players involved in the efficient removal of organic matter, nutrients, and other pollutants, also identifying the conditions favoring the proliferation of unwanted populations (ie. producing operational problems or increasing green-house gas emissions). The generated knowledge is useful for the design of novel processes minimizing the environmental impact of WW and the development of tools for process control and optimization, transferable to WW management companies. Within this line, I participated in 4 projects funded through Spanish/EU competitive calls. I also investigated N-transformations in microbial mats joining the NASA's Exobiology Program as a postdoctoral fellow (NASA-Ames, 2019-2021, USA). Currently I am participating in 3 funded projects: 2 in Spain and 1 in collaboration with Mexico, and I am PI of 2 funded projects: 1 in Spain and 1 in collaboration with Mexico.

My most relevant scientific-technic contributions include: 1) Isolating microalgae able to remove color and phenolics from olive-WW; 2) Optimizing a full-scale photobioreactor for the treatment of olive-washing-water; 3) Assessing the diversity of filamentous bacteria and fungi in a full-scale membrane bioreactor and analyzing the links among populations' dynamics, operational variables and foaming; 4) Proposing the ratio of metabolically active/total Mycolata as predictive tool for foaming control; 5) Revealing correlations between bacterial and archaeal populations' shifts and the removal efficiencies of pharmaceutically-active compounds from WW and digested sludge; 6) Providing the first description of the abundance and diversity of fungi in microbial mats and their roles in nutrient recycling; 7) Providing first evidence of an ancestral N-cycling pathway related to eHao and hcp-encoded prismane proteins in microbial mats; 8) Developing protocols and code construction for microbial quantification and large-scale analyses of metagenomic datasets.

Currently, I seek to consolidate and extend my research career addressing the study of the diversity and metagenomics of bacteriophages in WW. Bacteriophages remain poorly explored in biological WW treatment, despite their involvement in horizontal gene transfer, influence on treatment efficiency, and applicability as control for lethal microorganisms. The main goal of this research is to generate results/knowledge with potential clinical applications, through the identification/isolation of phages suitable for novel treatment strategies against drug multi-resistant superbugs. The research will be focused to: (I) generate new knowledge and demonstrate the metabolic potential of bacteriophages (II) establish the distribution of critical pathogens and resistance genes in WW (III) isolate phages and perform virulence assays against lethal bacterial IV) create an interactive platform, publicly available to all readers, for in-depth analysis and visualization of collected data on the presence of multidrug resistance bacteria and the mapping of the WW resistome

**Resumen del Currículum Vitae:**

I started my research career in the field of Environmental Technologies in 2009. I participated in 4 research projects within this line, funded through Spanish/ EU competitive calls. I also investigated N-transformations microbial mats, at NASA-Ames Research Center (USA). Currently I am participating in 3 funded projects: 2 in Spain and 1 in Mexico. And I am PI of 2 funded projects: 1 in Spain and 1 in collaboration with Mexico.

Through this multidisciplinary training, I acquired advanced skills and ample experience on the use of molecular methods for the characterization of microbial communities. I also developed protocols and contributed to code construction for microbial quantification and large-scale analyses of metagenomic data, made available for the scientific community. Thanks to my stays at U. Ghent, U. Berkeley, NASA-Ames, and U. Baja California my research benefited from collaborations with scientists worldwide, generating first authored, high impact-factor publications.

I have coauthored 33 papers published in international journals indexed in the JCR (h-index= 17). 26 papers (79%) are indexed in Q1, and 9 papers (30%) in D1. 10 papers are published in open-access. I am first author of 14 papers and corresponding author of 14 papers, 2 of them published in Water Research, ranking #1 in the Water Resources category. I was also invited to write 2 chapters for books published by Springer Nature, and sent 13 communications to national/international congresses.

Within the frame of the international project FP7-SME-CT2008-232331 (EU), I contributed to the transfer of knowledge between UGR and the company BIOTMICROGEN, by making available 2 microalgae strains able to remove phenolic compounds from olive washing water. I also wrote a manual on photobioreactor operation and was the instructor of a training course on the isolation and cultivation of microalgae at BIOTMICROGEN. I participate in informative activities aimed to disseminate science to stakeholders and large audiences, by using windows such as Nature Portfolio Ecology & Evolution Community, NASA Science Nugget, UGR YouTube channel, or local newspapers.

I have supervised a Master's thesis student (2016) and was a member of the evaluation board of 11 Master's thesis (21,23) at UGR. I mentored a PhD student for 6 months (19-20) and an undergraduate student for 1 month (2019) at NASA-Ames. Furthermore, I participated in the NASA College Scholarship Program, offering an interactive tour.

Currently, I'm co-supervising 2 PhD Mexican students in cooperation with U. Baja California. I was in the Organizing Committee of 2 congresses (1 national, 1 international). I have been a member of the Spanish Society of Microbiology since 2012, the Council of the Department of Microbiology at UGR since 2011, and the PAIDI RNM-270 Research Group since 2008. I joined as member of COVID-19 International Research Team. I acted as guest editor for the journal Water. I evaluated 3 research projects for Polish and Chilena administrations.

I have lectured >420 h of subjects of the Microbiology field for 3 BSc Degrees at UGR. I have participated in two teaching innovations projects and the production of an informative video (2011), receiving an Award for Teaching Innovation. In 2017, I was awarded the accreditation for Associate Professor by the Spanish National Agency Evaluation & Accreditation

**Resumen de la Memoria:**

Biogeography, as a scientific discipline, focuses on understanding how Life distributes in space and time, and why. It places great emphasis on unravelling the patterns and dynamics of diversity, often quantified in terms of species richness or the presence of endemic species. However, it has been rooted in the conviction that climate, dispersal, and historical contingencies account for much of contemporary patterns, ignoring, for the larger part, the influence of biotic interactions on biogeographical phenomena.

In marked contrast, ecological network studies analyse the interactions that occur between species within a community or an ecosystem and describe the structures of real ecosystems and their stability. Numerous theoretical and empirical studies have identified universal patterns and mechanisms by which species interact across different habitat types, which in turn affect community dynamics. These interaction patterns are not only key to understand biodiversity organization, but also to predict ecosystem stability and resistance to different components of environmental change. However, network ecology has often neglected the geographical factors and has concentrated on processes operating at limited geographical scales of extent.

My research lies in the integration of these two fields: network ecology and biogeography. Specifically, my research has focused on the integration of spatial and biogeographical processes into species interaction networks to better understand large-scale biodiversity patterns. My work has provided paramount knowledge about the mechanisms behind the geographical variation of complex ecological networks, the importance of the spatial scale for understanding network structure, or the influence of biotic interactions in determining species distributions. These cutting-edge findings and ideas have set the cornerstone on top of which the long-standing gap between biogeography and network ecology can start to be bridged.

Network Biogeography is thus an emerging field that offers new opportunities to better understand the distribution and dynamics of Life on Earth. By integrating network approaches with biogeographic principles, I aim to enhance our understanding of how the environment shapes ecological communities and how biotic interactions shape global biodiversity patterns. My vision is that the three major challenges to build and establish the field of Network Biogeography are:

1. Generate a paradigm shift from species distribution models to network distribution models.
2. Understand how biotic interactions shape biogeographical patterns across spatial scales.
3. Develop conservation strategies based on ecological networks rather than species alone.

My research plan for the following years is thus articulated along these three research objectives. My interdisciplinary theoretical-empirical approach, which merges the development of computational and mathematical theoretical models for ecological systems with the analysis of large, complex datasets, will be key to achieve these objectives. Network Biogeography is a highly promising field that will be essential to comprehend and predict the future of biodiversity and of the ecosystem services it provides in the current context of global environmental change.

**Resumen del Currículum Vitae:**

My research focuses on the integration of spatial and biogeographical processes into species interaction network research to better understand large-scale biodiversity patterns. The main objective of my research is twofold: to understand how ecological communities are organised across the globe and to disentangle the role of biotic interactions in determining large-scale biodiversity patterns. In particular, my work has provided paramount knowledge about the mechanisms behind the geographical variation of complex ecological networks, the importance of the spatial scale for understanding network structure, or the influence of biotic interactions in determining species distributions. These cutting-edge findings have contributed to bridge the traditional gap between biogeographical studies and network ecology, setting the cornerstone of the emerging field of Network Biogeography.

My research approach merges the development of computational and mathematical theoretical models for ecological systems with the analysis of large empirical datasets using sophisticated analytical tools. Through my training and years of research, I acquired a multidisciplinary background encompassing aspects of complex networks and biotic interactions, ecological theory and community dynamics, and more recently, species distribution modelling and Geographic Information Systems. This integrated set of scientific-technical skills allow me to tackle challenging problems at the interface between ecology and biogeography with a novel perspective.

In collaboration with my strong network of international collaborators, I published over 20 scientific articles in peer-reviewed journals and book chapters. These publications have collectively attracted 667 citations (Google Scholar, 27th Jan 2024), with i10- and h- indices of 14 and 12 respectively. I have been part of different European Research Council projects, and I have been awarded a Marie Sklodowska-Curie Individual Fellowship to develop my own research. Last year I have also received the L'Oréal-Unesco "For Women in Science" award.

I have contributed to the development of young researchers by supervising a Master student during my first postdoctoral position, and I am currently co-supervising 3 PhD students. I am a co-founder of the INTP (Institut Natura e Teoria en Pirinèus), an independent interdisciplinary research institute founded in 2019 devoted to extend fundamental research to a greater variety of profiles and develop rigorous concepts and tools for science at the

interfaces (https://intp.science). Within the INTP we organise a yearly autumn school on Theoretical Ecology in which I deliver the course on complex network theory.

I am Subject Editor for Ecography and I regularly serve as a reviewer for high-impact journals such as Nature Ecology and Evolution, American Naturalist, Ecography, Global Ecology and Biogeography, Proceedings of the Royal Society B, Oikos, Oecology and Frontiers in Ecology and Evolution. I have acted as reviewer of highly competitive research proposals for the National Science Foundation.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | VIRUEL SÁNCHEZ, JUAN |
| **Referencia:** | RYC2023-042611-I |
| **Correo Electrónico:** | juanviruel@gmail.com |
| **Título:** | Genética de la conservación |

**Resumen de la Memoria:**

My research background is in plant diversity including wild and cultivated species, and my research activities are focused on minor crops, crop wild relatives and threatened species, and I have become an expert in using different molecular techniques to understand patterns of distribution of biodiversity. My current research programme has been developed to answer to conservation needs in engagement with the final stakeholders, aiming at i) Identifying species and habitats priority for conservation (e.g., "Identifying and conserving resilient habitats in the British Virgin Islands"); ii) designing conservation plans for priority species (e.g., "Species boundaries delimitation within the genus Ilex in Puerto Rico, with emphasis on the Federally listed Ilex sintenisii and Ilex cooki"), and iii) prodiving tools for conservation management and monitoring (e.g., "Biodiversity metrics in the British Virgin Islands" and "Native Seeds for Restoration: diversity and resilience in the UK"). I also lead projects delivering the conservation action designed with genetic data, such as an ecological restoration programme to plant thousands of baobab trees in Madagascar in engagement with local communities ("Multidisciplinary conservation of the baobab Adansonia suarezensis"). I am currently supervising four PhD projects in conservation genetics (Varronia, Cordia, Zanthoxylum), in developing sustainable pathways to extract secondary metabolites from yams (Dioscorea), and phylogenomics and biogeography (Primula).

The publication of new methodologies and design of new methods have led to new publications, projects and collaborations. I have led a research line about identifying crop wild relatives, and their importance for conservation and crop breeding demonstrated by projects obtained. I developed a methodology (doi.org/10.1093/botlinnean/boaa064) to estimate the potential cross-compatibility between species in plants using phylogenetic distance metrics, an important trait for crop breeding. I designed a bioinformatic pipeline to determine the ploidy level of a sample from genomic data (10.3389/fpls.2019.00937), which has been subsequently used on other publications.

My future research will maintain its focus on biodiversity conservation and conservation genetics. I will continue engaging with final stakeholders to develop scientific programmes and to ensure the application and impact of the results obtained in the projects. My research can be organised in three main components:

1)      Identification of species and habitats priority for conservation, including crop wild relatives and species delimitation to resolve taxonomic conflicts.
2)      Designing conservation plans for threatened species and implementation of nature-based solutions for their preservation.
3)      Assessing ongoing or past conservation actions using genetic methods.

The main research project that I will develop will optimise the calculation of biodiversity metrics with newly generated data for plants in the context of the genetic indicators proposed in the post-2020 CBD framework.

**Resumen del Currículum Vitae:**

I am Research Leader in Conservation Genetics at Royal Botanic Gardens, Kew since 2019. I have published 55 peer-reviewed articles in scientific journals (15 first author, 12 senior last author), and I have contributed with chapters to different books (Google scholar 1406 citations, h=23, i10 index=34). I am currently PI or co-PI of ongoing project totalling over £1.5M, and I have a strong track record of leading and collaborating in several projects, having obtained funds from different competitive calls (e.g., Marie Sklodowska-Curie Individual Fellowship, Darwin Initiative). I have built a strong network of international collaborations, with projects in or with researchers from UK, Spain, France, Puerto Rico, British Virgin Islands, South Africa, Sweden, Netherlands. I am supervising four PhD thesis in different institutions (Puerto Rico University, Royal Holloway, Portsmouth University, Amsterdam University), and I will start supervising two new PhD students (Stellenbosch University) in 2024.

Recent publications

Tovar C (AC), Hudson L, Cuesta F, .„.Viruel J (AC) [Position 29/29]. 2023. Strategies of diaspore dispersal investment in Compositae: the case of the Andean highlands. Annals of Botany 132:255-267, doi.org/10.1093/aob/mcad099 [Cited by 2]

Campos M, Kelley K, Gravendeel B, .„.Viruel J (AC) [10/10] 2023. Genomic, spatial and morphometric data for discrimination of four species in the Mediterranean Tamus clade of yams (Dioscorea, Dioscoreaceae). Annals of Botany 131: 635–654, 10.1093/aob/mcad018 [Cited by 1]

Baumel A, Nieto Feliner G, Medail F,.„.Viruel J [12/12] 2022. Genome-wide footprints in the carob tree (Ceratonia siliqua) unveil a new domestication pattern of fruit trees in the Mediterranean. Molecular Ecology 31: 4095-4111, 10.1111/mec.16563 [Cited by 9]

Christenhusz MJM, Chase MW, Fay MF, Hidalgo O, Leitch IJ, Pellicer J, Viruel J. 2021. Biogeography and genome size evolution of the oldest extant vascular plant genus, Equisetum (Equisetaceae). Annals of Botany 127:681-695, 10.1093/aob/mcab005 [Cited by 14]

Viruel J [AC], Kantar MB, Gargiulo R, .„.Wilkin P (1/11). 2021. Crop wild phylorelatives (CWPs): phylogenetic distance, cytogenetic compatibility and breeding system data enable estimation of crop wild relative gene pool classification. Botanical Journal of the Linnean Society 195: 1-33, 10.1093/botlinnean/boaa064 [Cited by 28]

Viruel J [AC], Conejero M, Hidalgo O, .„.Leitch I (1/12). 2019. A target capture-based method to estimate ploidy from herbarium specimens. Frontiers in Plant Sciences, 10: 937, 10.3389/fpls.2019.00937 [Cited by 57]

Recent projects as PI or co-PI

(2023-2026): Biodiversity metrics for conservation management in the British Virgin Islands. Darwin Plus Main Round 11. Awarded £396,655 (total with co-funding is £587,012). PI: Juan Viruel. https://www.darwininitiative.org.uk/project/DPLUS183/

(2022-2023) "BaoBat 2": Multidisciplinary conservation of the baobab Adansonia suarezensis. Guardian & Observer Charity Appeal Project Fund. Awarded £60,000 (£69,000  with overheads). PI: Juan Viruel https://www.kew.org/science/our-science/projects/conservation-of-the-baobab

(2017-2019) YAMNOMICS - Phylogenomics, evolution, biogeography and key traits for breeders in yams (Dioscorea, Dioscoreaceae). RBG Kew. Marie Sklodowska-Curie Individual Fellowship. Awarded: 183,454.8€ PI: Juan Viruel.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | CASAL PASCUAL, GEMA |
| **Referencia:** | RYC2023-044898-I |
| **Correo Electrónico:** | gema.casal@gmail.com |
| **Título:** | Teledetección óptica en aplicaciones marinas y costeras |

**Resumen de la Memoria:**

During my PhD at the University of A Coruña (UDC) I assessed several passive optical remote sensors for intertidal and subtidal seabed mapping, with a special focus on macroalgae. It can be considered a comprehensive comparison of different sensors and platforms (multispectral vs hyperspectral, satellite vs airborne) that served as a basis for future research, especially related to hyperspectral applications and sensors. After obtaining my PhD I spent one year as postdoctoral researcher at the Estonian Marine Institute (University of Tartu). The results obtained advanced the knowledge in the global role of lakes for mitigating climate change and created new methodologies to extract water quality parameters from satellite data in waters with high content in Coloured Organic Matter (CDOM). After that, I moved to Ireland where I joined the Marine Institute (MI) as remote sensing expert to develop a more independent scientific role. As a Scientific and Technical Officer (STO) I was responsible for building a basic capacity in remote sensing for marine and coastal applications. In this position, I also collaborated with several departments to integrate remote sensing data for different purposes. Among these collaborations I would like to highlight my participation in the pre-operational assessment of the biogeochemical model Iberia-Biscay-Ireland (IBI) developed within the Copernicus Marine Environment Monitoring Service (CMEMS). At Maynooth University (Ireland), I was the principal investigator (PI) of the two-year project BaSMaI (2017-2019). In this project we first evaluated Sentinel-2 data in Ireland's coastal waters (optically complex waters) to derive bathymetry. Since 2020, I have worked as a Senior Postdoctoral Researcher for the MaCoBioS H2020 project at Maynooth University. In MaCoBioS, I act as remote sensing expert for the project, integrating remote sensing data into different tasks and ecosystems and as the case study referent for Ireland. I am also the co-leader of the Task 5.2 which involves the development of a Toolbox. As seen in my CVA, I was part of multidisciplinary groups and centres where I led remote sensing activities, developing my own research lines or integrating remote sensing into other disciplines such as fisheries, biodiversity, and climate change. This holistic approach not only broadened my expertise but also demonstrated my commitment to addressing complex environmental challenges through the lens of remote sensing. This multidisciplinary aspect significantly reinforced my profile, emphasizing not just technical proficiency but a comprehensive understanding of the real-world implications and applications of remote sensing in varied contexts.

**Resumen del Currículum Vitae:**

After obtaining my PhD in 2012 I obtained 5 postdoctoral contracts outside Spain. I have published 27 scientific papers, being in 20 of them first author (77%). 22 out of 26 were published in international scientific journals (84%) and 17 of them had at least one international collaborator (63%). Following Google Scholar these publications have reached 786 citations (30/01/2024) with an h-index of 14. I was co-guest editor in two special issues at the Remote sensing journal (open access) and I have contributed to >20 national and international conferences (oral and poster presentations) including ESA Living Planet Symposium or International Ocean Colour Meeting. I have participated in 13 scientific projects (2 regional, 4 national and 7 international) obtaining a total amount of funds as PI of €156.307 (2 research projects and 1 Cost Action STSM). I also participated as a member of the applicant consortium in MaCoBioS H2020 obtaining €380,908.75 for Maynooth University. During my research career, I took part in several outreach activities. For example, I was a participant in the "Dive Into Science: European Researchers Night (04492), contributor in the Living Textbook (LTB) (EO4GEO project), and published articles in Gciencia and Hydro International. Regarding academic activities, I performed 150 h of teaching (Biology degree) at the Faculty of Science (UDC). As a contractor (independent investigator) for the GSI, I developed educational material for the master "GIS and Remote Sensing" given by Maynooth University (Ireland). As a STO at MI I was involved in the technical assistance of a PhD Cullen Fellowship (2015-2017) and supervised a bursar student (June-August 2016). I have also been a member of 2 PhD committees. In 2022, I was nominated as a national expert (Ireland) to participate in the JPI Oceans Scoping Action Light and Colour in the Ocean (2022-2023) and I am a member of the IOCCG Working Group Benthic Reflectance (2020 to date) and Future Coast Lagoons for Life Forum (2019 to date). In 2020, I obtained a positive evaluation for the I3 certificate.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | FREIRE LISTA, DAVID MARTÍN |
| **Referencia:** | RYC2023-042760-I |
| **Correo Electrónico:** | davidfreire@utad.pt |
| **Título:** | Conservación del patrimonio. Materiales de construcción. |

**Resumen de la Memoria:**

Dr. Freire-Lista (F-L) obtained a bachelor's degree in Geological Sciences at the University of Oviedo (2006), a master's degree in Environmental Geology and Geological Resources at Complutense University of Madrid (UCM) (2010), and a PhD in Geology and Geological Engineering at UCM (2016). F-L's main research line focuses on heritage stones and their value enhancement. He has specialized in petrography, historical quarries, durability and decay of geomaterials, geoheritage, and geoturism.

F-L worked in the Petrology Applied to Heritage Conservation Research Group of the Institute of Geosciences (IGEO). He was hired by Geomaterials 1 (P2009/MAT-1629) and Geomaterials 2 (S2013/MIT-2914) programs (2009-2018), both funded by the Community of Madrid and the European Social Fund. Between 2014 and 2015 he was hired through the International Programme for Attracting Talent (PICATA), continuing to work in the same research group. In 2018 he began to work at University College London (Qatar), collaborating with Qatar Museums Authority. He won a competitive contract under the Portuguese program for Stimulus to Scientific Employment Individual Support, and since 2019 he works at the University of Tras-os-Montes e Alto Douro (UTAD) and at the Geosciences Center (CGeo) of the University of Coimbra (Portugal). He is currently the P.I. of a project titled "Heritage Stones of North Portugal".

F-L has 40 Scopus-indexed articles; he is the first author of 26 articles, with an average citation number of 23, a FWCI of 1.9, and an H-index of 13. F-L is currently an independent researcher; of his last 16 articles, 15 have been co-written with fellow researchers outside the Petrology Applied to Heritage Conservation Research Group, with which he did his PhD thesis. F-L research interests have been expanded due to collaboration with other research groups of prestige in the field of building stones and through the development of new approaches and analytical techniques. In addition, he started a new line of research that involves the study of Romanesque churches through glyptographic analyses with laser rugosimeter, characterization of pigments in mural paintings, and mortars characterization. As a result, he has diversified his scope of study to other geomaterials. Thanks to his international collaborations, F-L applied new techniques such as laser ablation, Raman spectroscopy, OSL, Sr-isotope analysis and dilatometry tests among others.

Since he started his individual research career, F-L has collaborated with international institutions such as University College London, University of Leicester, Qatar Museums Authority, Catholic University of Porto, University of Padua, and University of Reims among others. He has been a visiting scientist at University College London, A Coruña University, and the Center for Human and Social Sciences (CSIC), among other institutions. F-L frequently hosts international researchers at UTAD. With all these collaborators, he develops research projects whose results are scientific publications, student training, conferences and scientific dissemination.

**Resumen del Currículum Vitae:**

Dr. Freire-Lista (F-L) has been an expert, researcher, and promoter of geology as a way to understand its relation to built heritage, humans, and the environment for over 8 years. He has undertaken research in public, private, and educational institutions, and its results have been published and communicated on media, social networks, and scientific publications. F-L specializes in geology applied to built heritage. His major research interests include geomaterials characterization; location of historical quarries; accelerated artificial aging tests; durability evaluation; development of innovative environmental technologies; and geoheritage and geoturism aimed at managing, assessing and mitigating natural and anthropogenic decay on built-heritage geomaterials. F-L's research activity has mainly been developed at the Trás-os-Montes e Alto Douro University (UTAD), Geosciences Center of the Coimbra University (CGeo), University College London (UCL), Geosciences Institute IGEO (CSIC, UCM), and University of Texas at Austin. He has published 40 Scopus Core Collections with 714 citations, and a H-index of 13 (Scopus). F-L is the first author of 26 articles, with an average citation number of 23 and FWCI: 1.9 (Scopus). His articles are hosted in open repositories and they are disseminated in the media. F-L actively collaborates with scientific dissemination agencies to promote and value stone cultural heritage. He advocates for greater accessibility and difussion of his research. In addition, F-L was quality management system's responsible at the Petrophysics Laboratory, IGEO (CSIC, UCM). He wrote its Normative Work Procedures (NWP) and validated its analytical techniques for AENOR certification. F-L has co-supervised three PhD theses and a senior thesis. In addition, he has evaluated a PhD thesis. He has instilled scientific rigor in all his students and taught the most cutting-edge techniques in the analysis of building stones. F-L's research interests have expanded because of collaboration with research groups of recognised prestige in the field of building stones, and he has developed new approaches and analytical techniques. F-L collaborates with international institutions, and he is an independent researcher. In recent years, he has developed new research lines and applied new techniques such as laser ablation, Raman spectroscopy, optically stimulated luminescence, Sr-isotope analysis, and dilatometry tests, among others. F-L's leadership skills have materialised in the search for funding and the coordination of research projects financed by the Community of Madrid and the European Social Fund, State Subprogram for Knowledge Generation (Spanish state plan); and Qatari, Italian, Portuguese, and USA institutions, among others. He has coordinated interdisciplinary teams (archaeology, history, restoration, architecture, and arts). F-L is honoured to have been elected a voting member of the International Union of Geological Sciences (IUGS) Sub-Commission on Heritage Stones for his continued contributions.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
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| **Correo Electrónico:** | morandini@mncn.csic.es |
| **Título:** | Population dynamics of long-lived birds species in an Era of Rapid Change |

**Resumen de la Memoria:**

A fundamental objective of ecology and population biology is to identify factors that drive population dynamics and determine the population-level consequences of their interaction with the environment. The overall goal of my research is to improve our understanding about which factors regulate population dynamics of long-lived species at a metapopulation level. My research in population ecology has been focused on four main areas including a) population dynamics modelling, b) movement ecology, c) animal physiology and behavior and, d) microbiology and emerging diseases.

My research career started with the understanding of the factors that regulate and influence populations' numbers particularly for species with complex life histories and demographic dynamics. During my PhD I used new established populations of apex bird species to understand how density-dependent and independent processes influence their demographic parameters, and hence regulate population size of long-lived birds. In this sense, to integrate movement ecology into metapopulation theory provides an adequate conceptual framework to understand population dynamics. Species' dispersal capabilities could be the key for species persistence and connectivity, and can increase overall populations' viability. Given that long-lived birds, as raptors and seabirds, provide good examples of metapopulation structure and dynamics, I included birds' dispersal and migration as an additional study area in my research trajectory.

During my PostDoc, I expanded my original questions about population regulation to include how demographic anomalies, e.g. breeding failures, periods of decreased survival or productivity, affect population demography. I also included the role of individual nutritional and physiological conditions of long-lived birds in the study of populations. As result, I demonstrate that physiology constitutes a crucial component in the understanding of ecological and behavioral issues. The multidisciplinary approach of my trajectory gave the additional opportunity to create collaborations with virologist and veterinaries that motivated me to include in my research the area of microbiology and emerging diseases as key factors in the understanding of population dynamics.

Nowadays, I am exploring the role of individual variability on population regulation. Previous studies showed that trait variation among individuals could exceed variability found across all other species within a community, thus my work also focuses on the role of personality and individual traits as drivers of population changes to better understand population dynamics. The emergence and reemergence of zoonotic pathogens is increasing around the globe; in this sense, for a variety of diseases, 10% of the host population has the potential to cause 80% of transmission. I expect to investigate the role of individuals in pathogens spreading and its consequences on population dynamics using different species migrating over one of the most challenging ecological barriers of the planet: the Antarctic Circumpolar Current.

Finally, scaling from an individual-level understanding of the individual traits through this multifaceted approach, I hope to contribute a novel understanding of the population dynamics under environmental variability and human-related disturbances.

**Resumen del Currículum Vitae:**

My main research line explores factors that regulate population dynamics of long-lived species at a metapopulation level.During my PhD I explored density-related factors in colonizing populations of birds, settling the bases of colonizing processes of long-lived birds, which have already been applied worldwide on reintroduction management strategies. I acquired proficient knowledge in population dynamics, movement ecology and birds' physiology.

During my Post-Doc I explored demography of metapopulations of long-lived species and fine-scale movements analyses, learning to work with big-data, accelerometer data as well as to expert capture re-capture softwares. Results from my research disentangled variation in population vital rates and environmental variables of some penguin populations in Antarctica. My research about animal behaviour has been coordinated with my knowledge on physiology and movement ecology settling the bases of personality and physiology of some bird's species. The collaboration with veterinarians and experts on birds' parasites allowed me to join different projects focused on birds' pathogens. I have published 46 scientific papers (3 in press) 32 in Q1 journals, 31 as first or second author, 4 as senior and 3 chapters in books. My h-index is 14 and i-index is 20, and 523 citations (Google scholar).

I collaborated with more than 30 international institutions and stayed > 36 months in universities abroad as PostDoc, giving courses and mentoring students. I have been part of 1 national project with private companies, 4 international projects as PostDoc and collaborator, co-PI of one international project and PI of one four-year National Plan project. Since 2021 I have been involved in the SCAR working group for health monitoring of Antarctic mammals and birds. My career includes applied ecology, contracts with private companies, and management papers that contribute to the knowledge of the effect of human infrastructures on wildlife. I have presented 22 contributions in international and national conferences (20 oral presentations as first author). I have been invited as seminar guest talk at academic/research institutions of 10 countries. I participated in TV interviews (e.g. Informe Semanal – TVE), online/printed press (e.g.Science, El Pais, Quercus, La Vanguardia). And participated in open talks in schools, auditoriums and museums of Spain.

I mentored 20 students including undergraduate and MSc students. I am currently mentoring 1 undergraduate and 1 MSc students from Universidad Complutense de Madrid that pursuit to start a research career. I am co-directing a PhD student (FPU grant) which I included in my Plan National project PID2019-108597RB-I00 and in collaborative objectives with international institutions. I have been Editor of a Frontiers in Ecology and Evolution special issue; I am currently Associate Editor for the Journal Frontiers in Birds Science, Editorial Board of a Polar Biology Special Issue and served as reviewer for >15 international scientific journals. I am part of the tribunal for the PhD thesis student Jorge García Macía (University of Valencia).

I received 3 fellowships, 2 international contracts (from NSF projects), 1 travel bursary for conference attendance, 6 individual awards for scientific merits and obtained funding for 2 projects as PI.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | MERINO GARCÍA, IVÁN |
| **Referencia:** | RYC2023-043378-I |
| **Correo Electrónico:** | ivan.merino791@gmail.com |
| **Título:** | Sustainable CO2 valorization technologies to promote the transition towards a low-carbon economy |

**Resumen de la Memoria:**

The research line carried out by Dr. Merino mainly focuses on the development of green CO2 valorization technologies to mitigate CO2 impacts and promote the transition towards a low-carbon economy to sustain socio-economic progress in a world of finite resources, which represents one of the major challenges in this 21st century. The research career of Dr. Merino has clearly been carried out in an international and multidisciplinary framework based on international contracts, collaborations, and several research mobility activities in international groups/universities of recognized prestige, such as the Photocatalytic Synthesis Group (University of Twente), LISE laboratory (Sorbonne University), and LAQV-REQUIMTE (New University of Lisbon). Dr. Merino has been actively involved during his research career not only in the coordination and elaboration of project proposals in national and international calls but also in leading objectives and specific tasks in different funded projects, such as CAPTUS (European project - Innovation Action), HISRU (European project funded by European Space Agency), CO2MIC (MCIN/AEI), VALCO2-T (MCIN/AEI), etc. Dr. Merino is pioneer on evaluating SnO2 NPs for an enhanced CO2-to-formate in a flow electrolyzer, satisfying the requirements of this technology to become industrially feasible. He is also actively participating in technological transfer activities to local industries, such as GCPV and Textil Santanderina (carbon footprint reduction). Moreover, he belongs to the Research Team of a recent project with the company Derivados del Fluor for valorization of waste streams towards economy decarbonization. Dr. Merino also participated in the project proposal (working team) "Integrated photo-assisted electrochemical processes for the co-valorisation of CO2 and glycerol (CO2GLY)", recently funded in the call Proyectos de Generación de Conocimiento 2022 (MCIN/AEI). He has participated in dissemination activities to the general public through the European Researchers' Night, Pint of Science, Science Week UC, and UC en tu barrio, among others. As a result of his intense scientific activity, Dr. Merino has reported a total of 45 publications, including more than 20 scientific articles in high impact journals with significant contribution as first author (20% D1; 60% Q1), 2 books, 2 book chapters, and 21 contributions to conference proceedings with ISBN. His work has received a total of 726 citations in a short period of time (h index = 12), which denotes the research potential of the candidate. He also disseminated his results by more than 40 contributions to national and international conferences. He has participated in 16 competitive research projects and more than 10 financial grants, highlighting the participation in two European Projects (coordination, leading objectives and tasks, etc.). Besides, he participated in several mentoring activities such as degree projects and master thesis, including the supervision of guest researchers at UC. He also was the main jury member in the evaluation of 2 master theses and he evaluated 6 PhD Thesis for the International Doctorate Mention. These activities denoted the potential of the candidate and demonstrated independent thinking and leadership capacities in the development of innovative CO2 conversion technologies for climate change mitigation and economy decarbonization.

**Resumen del Currículum Vitae:**

Dr. Merino focuses his research on the development of sustainable CO2 valorization technologies to mitigate CO2 impacts and promote economy decarbonization. He joined the PhD program in Chemical Engineering, Energy and Processes to design and develop a system for gas-phase CO2 reduction to hydrocarbons. In this period, he completed a research stay at University of Twente to manufacture Cu-based hollow fiber electrodes for enhanced CO2 conversion. He published a total of 5 scientific articles derived from his PhD work in high impact journals, 2 books, 10 publications in peer-reviewed conference proceedings with ISBN, and 14 contributions in national and international conferences. The obtained results were also recognized in 2019 by two awards for the Best PhD Thesis, from the Chemical Engineering group of the Spanish Royal Society of Chemistry (GIQ-RSEQ) and from Association of Chemistry and Chemical Engineering of Cantabria (AQUIQÁN). After the dissertation defense in April 2018 (Cum Laude, International Mention), he obtained a one-year postdoctoral contract from MINECO at UC, where Dr. Merino continued developing Cu-based electrocatalysts for an improved CO2 reduction to ethylene. Besides, he was invited to carry out an international postdoctoral stay at Sorbonne University to develop novel SnO2 materials for a more efficient CO2-to-formate process, achieving the results needed to make this technology industrially feasible. After this first postdoctoral period, he conquered a two-year postdoctoral contract at the New University of Lisbon to develop permselective anion-exchange membranes for salinity gradient power. In June 2021, he conquered several postdoctoral contracts at UC to work on light-driven CO2 conversion processes (MCIN/AEI), overcoming the barriers in the artificial photosynthesis to get closer to practical applications. Besides, he participates in two European projects: CAPTUS (Innovation Action) for carbon footprint reduction in a cement industry and HISRU (European Space Agency) to develop a hybrid photoelectrochemical system for CO2 reduction to CH4 (as space propellant for future Mar missions) and astronaut grew water oxidation in an in-situ resource utilization approach. Moreover, Dr. Merino has been actively involved in the preparation and coordination of national (MCIN/AEI) calls for funding acquisition in collaboration with several entities and local industries, resulting recently in positively funded proposals, where the candidate leads specific objectives and tasks of those projects. His main research interests are in the field of electro-, photo- and photoelectro-catalytic conversion of CO2 to value-added chemicals and, in particular, in the development of photo-assisted processes in optimized reactors, and the application of innovative materials, which he develops in collaboration with national and international groups. Dr. Merino has reported 45 publications, including more than 20 scientific articles in high impact journals (20% D1; 60% Q1), 2 books, 2 book chapters and 21 contributions to conference proceedings with ISBN. He has participated in 16 competitive research projects and more than 10 financial grants. Besides, he participated in several mentoring activities such as degree projects and master thesis, including the evaluation of 6 PhD Thesis for the International Doctorate Mention.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
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| **Título:** | Linking ecology and paleoecology in aquatic ecosystems |

**Resumen de la Memoria:**

My research program revolves around the ecology and paleoecology of global change, with a focus on the quantification of resilience in aquatic ecosystems and their biota. Much of my work helps advance a set of quantitative tools to investigate catchment and climate forcings across the aquatic continuum (e.g., from high-mountain lakes to river deltas) and across time (e.g., from seasonal to paleolimnological observations). I specialize in wide continental-marine biological indicators (diatoms and foraminifera), although my projects complement taxa-based reconstructions with geochemical and human traces approaches. My PhD (University Rovira and Virgili, Spain, 2016) contributed to a better understanding of past environments in Mediterranean coastal wetlands through the development and application of biological indicators seldom used together in such dynamic ecosystems (diatoms and foraminifera), publishing 6 papers, 2 of them during two international research stays. Between 2016 and 2018, I joined the Sheri Fritz lab at the University of Nebraska-Lincoln in a project-oriented postdoc where I cross-core fertilized aquatic ecology and macroecology of diatoms in a new University Department (Geosciences), publishing 5 papers and leading one research project (National Geographic) as well as visiting several international research centers. Then, I was awarded an independent, competitive postdoctoral fellowship at SESYNC (University of Maryland), a worldwide leading interdisciplinary research synthesis center in coupled human-environmental systems. I initiated a new research line on quantitative environmental change that was further supported by a synthesis working group project I led (Canadian Institute of Ecology and Evolution) resulting in 4 original publications and one review paper. By then, I gained an international reputation through the creation of a global network of past socio-environmental systems funded by PAGES and INQUA (19k EUR). Since 2021, I am working with my Beatriu de Pinós-Marie Curie COFUND fellowship at IRTA where I consolidated my research independence (e.g., coordinating private contracts with the public administration [62k EUR], leading research projects [22k EUR], supervising students), and boosted my recognition through editorial activity, invited talks, and outreach and dissemination. I am also a part-time adjunct professorship at the University of Barcelona, accumulating more than 350h of teaching and departmental duties (e.g., coordination of BSc courses). Overall, my research program advanced the concept of an aquatic-terrestrial continuum and quantitatively incorporated the climatic (geochemistry, terrestrial paleoecology) and human (archaeology) components on their millennial-scale dynamics. Now, it is broadly accepted that the resilience of aquatic ecosystems cannot be uncoupled from their past environmental and human contexts. In the next 5 years, I plan to continue delving into past trends and magnitudes of aquatic ecological change (reconstruction), present-day species-environment relationships (calibration), and their possible future behavior (projection). To do that, I will use methods and approaches borrowed from ecology and geosciences to diversify each of these scientific disciplines for near-future global change vulnerability assessment.

**Resumen del Currículum Vitae:**

I got a PhD in aquatic ecology (2016) from IRTA's Aquatic Ecosystem Unit and University Rovira and Virgili (Spain) and held two international research stays (Poland and US). My postdoctoral positions were funded through competitive calls, first obtaining a project-oriented postdoc at the University of Nebraska-Lincoln (2016-2018), and then two independent fellowships: US University of Maryland National Socio-Environmental Synthesis Center (2018-2020), and IRTA's Marine and Continental Waters Programme as a Beatriu de Pinós-Marie Curie COFUND fellow (2021-2024). These positions have allowed me to establish my research program revolving around 1) calibration of biological proxies in sentinel aquatic ecosystems (i.e., mountain lakes and river deltas) for tracking global change impacts, and 2) dynamics of past environments with natural and human-altered environmental regimes.

The productivity (2.5 papers/year), quantity (23 JCR publications; 80% are Q1 + Q2, first author of 11, 1 senior, and 5 without my PhD and postdoc supervisors), & impact (338 non-self-citations, h-index of 13 Gscholar; 60% of overall citation percentile median above journal's impact factor) seem outstanding regarding my career stage. I participated in 8 R+D competitive research projects funded by public entities and led as a PI/co-PI 9 (6 funded by international agencies, 3 R+D non-competitive national contracts; >280k €). I have been invited to give 7 talks, including 1 keynote presentation and 6 guest presentations. Overall, I presented my research findings at 25 national and international conferences (19 oral talks and 2 posters).

I created and currently chairing the working group on past socio-environmental systems, a joint venture of Past Global Changes (PAGES) and the International Union for Quaternary Research (INQUA). This allowed me to gain research independence (e.g., leading two database research projects as a co-PI and publishing no-JCR articles about data sharing practices) and international reputation (e.g., editorial activity serving as an associate editor of Marine and Freshwater Research, IF=2.36; guest editor of PAGES Magazine). My teaching experiences combine undergraduate and graduate courses in the US and Spain; the latter as a part-time adjunct professor at the University of Barcelona with >350h of official BSc and MSc courses. I have co-mentored 1 PhD thesis (University of Nebraska-Lincoln, US), and supervised two BSc projects (University of Girona), with two more undergraduate students and one PhD ongoing.

My status as an early-career leader is further demonstrated by i) a well-established global network of collaborators (>60 researchers from 20 different countries in 4 continents), ii) my service to the scientific community through the coordination of collaborative initiatives (e.g., design and development of the Young Diatomists section of the ISDR), iii) gained recognition (R3 distinction, NEON ASLO-SFS Early-Career Scholar award), and iv) fostering open data (leader of the tropical South American Diatom Database constituent for Neotoma). I have been widely involved in science communication, including interviews in local newspapers and television, and talks to schools. I am co-editing the blog post "Diatom of the Month" which has been publishing monthly outreach posts for 5 years in a row. I am an active member of the Gender and Science group of the Iberian Association of Limnology (AIL) by coordinating the world exhibit "Women in Limnolog

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | SAYOL ALTARRIBA, FERRAN |
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| **Correo Electrónico:** | fsayol@gmail.com |
| **Título:** | Understanding the origination and loss of biodiversity |

**Resumen de la Memoria:**

As far as I can remember, I have always been fascinated by the natural world, and I feel really fortunate to being able to pursue this interest as a professional career. Following this research interests, I recently started my independent research group at CREAF thanks to a "La Caixa" Junior Leader grant. My research aims to better understanding the past, present and future of biodiversity, with a special focus on animal ecology. My research has a strong basic science component, aiming to understand how biodiversity evolves, but also a more applied side, where I quantify the biodiversity loss related to human impacts, which can help guiding conservation efforts.

My academic trajectory started with my Ph.D. (2014-2018), where I focused on how environmental variation affects the evolution of brain size in birds. During the Ph.D., I provided strong evidence that birds living in more variable environments have evolved larger brains (Sayol et al., 2016, 2018 Nature Commun.). During my thesis, I also conducted a three-months project at Scranton University (USA), where I developed a study on the ecological causes of brain size evolution in bees (Sayol et al. 2020 Proceedings Royal Soc. B).

Following the defence of my Ph.D., I began to concentrate more on the effects of species traits on their tolerance to anthropogenic impacts. I began my first postdoc at the University of Gothenburg in Sweden (2018–2020), where I expanded my research to learn more about how specific traits may affect a species' tolerance to anthropogenic impacts. I created an extensive dataset on all known extinctions of birds due to human activity for this project (Sayol et al. 2020 Sci Adv.). In a subsequent paper, we concentrated on the functional diversity of island bird communities before and after anthropogenic impacts, demonstrating how some ecological functions have been lost through extinction (Sayol et al. 2021 Sci Adv.). I later joined the University College London (UK, 2020–2022), where I developed a project on the evolution of ecological niches and functional roles of birds, and how they are currently threatened by human impacts. During this postdoc I also assisted in the development of a large-scale initiative to compile morphological and ecological data for all known extant birds (Tobias et al., 2022 Ecology Letters).

In 2023 I was awarded a Junior Leader fellowship from the "La Caixa" Foundation, with allowed to start an independent research group at CREAF. My current group consists of three Ph.D. students, two Master's students and two research assistants. Altogether, we try to better understand how biodiversity has evolved and how it can be lost by human impacts. To address this topic, we combine different approaches, including data from natural history collections, the field and the literature, and the use of various analytical techniques including phylogenetic comparative analysis and algorithms from artificial intelligence (including machine learning). I believe that our findings will get the attention of a various target audiences, including evolutionary biologists and conservation biologists, and that they will offer important information for preserving biodiversity on our rapidly changing planet.

**Resumen del Currículum Vitae:**

I am an evolutionary ecologist, with a wide interest in the study of biodiversity. Currently, I am leading a research group at CREAF, thanks to a "La Caixa" Junior Leader fellowship (2023). My research focuses on understanding the processes that generate biodiversity, and predicting how biodiversity will be affected by current threats associated with human impacts. I completed my Ph.D. in 2018, for which I obtained the Ph.D. Extraordinary Award (2017–2018) and the SEO–Birdlife Award for the Best Ph.D. in Ornithology (2018–2020).

Over my academic career I have contributed over 31 indexed publications in both integrative and ecological journals, including Science, Science Advances, Nature Communications, Ecology Letters and Proceedings B. During my PhD thesis, at the Autonomous University of Barcelona (UAB), I contributed to better understand how behavioural flexibility can help animals to deal with environmental challenges. After my Ph.D., I expanded my research to better understand the current biodiversity crisis. To accomplish this, I carried out a postdoc at the University of Gothenburg (Sweden, 2018-2020), where I looked into the global patterns of bird extinctions and led creation of a global dataset on anthropogenic bird extinctions. I then obtained a Marie Sklodowska-Curie Postdoctoral Fellowship, and joined the University College London (UK, 2020–2022), where I looked at the relationship between the risk of extinction and the functional role of species.

I have regularly presented my research at international conferences in order to share it with the scientific community. I have given 15 oral talks at various events, such as the ESA Conference in Baltimore in 2015, the Evolution Joint Congress in Montpelier in 2018, and the IBS Conferences in Malaga and Vancouver in 2022. Additionally, I have made an effort to share my findings with the general public by taking part in a variety of scientific outreach activities, such as "Coffee with Scientists" for the Gothenburg Science Festival (2018) and a science talk at Lammas School in London during Science Week (2022).

Given the relevance of my research for biodiversity conservation, I have been increasingly interested in providing knowledge-transfer to stake-holders (wildlife biologists, conservation agencies and the general public). For this aim, I have leaded various outreach activities (popular science talks and publications) to make the public aware about the consequences of biodiversity loss, and I am currently coordinating a citizen science network for the long-term survey of meso-carnivores, involving >400 camera-traps and >120 volunteers.

My independence and leadership skills have been growing since I started my career, in part thanks to my capacity to secure national and international funding, whether through fellowships (MSCA-IF fellowship 2020) or research projects (BOU Bursary Scheme 2018, SYNTHESYS+ 2019, "La Caixa" Junior

Leader 2023). I have also enjoyed the opportunity to mentor and supervise more than 15 students, including the dissertations of 3 undergraduate students and 10 MSc students. I am also currently co-supervising three Ph.D. students and two Master' s students. Given my academic training and experience, my next step is to secure a permanent position in the Spanish research system. The Ramon y Cajal fellowship provides an ideal opportunity to achieve this goal.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | JABALERA CABRERIZO, MARCO |
| **Referencia:** | RYC2023-042504-I |
| **Correo Electrónico:** | marcojabalera@gmail.com |
| **Título:** | Microbial plankton under a multiple global-change drivers context: from organisms to ecosystems |

**Resumen de la Memoria:**

My research focuses on marine planktonic microbial food webs structure and functioning. I investigate their role in carbon cycling, paying particular attention to phytoplankton-bacteria-microzooplankton interactions, and linkages in the context of global change. Over my research vitae I have evolved from monitoring and experimental setups to satellite and meta-analytical approaches. This allows me to test a wide variety of hypothesis in the field and in the laboratory with organisms and natural communities and with large databases to unveil general patterns in nature.

My career started in 2010 thanks to a Collaboration Fellowship (Spanish Ministry of Education), and two research contracts (2011 and 2012). In 2013, I started my PhD with a FPU grant to explore the role of multiple global-change drivers on shaping microbial populations and communities' physiology and ecology, and the metabolic balance in the context of global change. I combined laboratory, field campaigns with innovative mesocosm experiments, publishing 5 first-author papers (Cabrerizo et al., 2014, 2016, 2017a,b, 2018). From these results, I moved my interest to study the success of mixotrophy in oligotrophic environments at University of Granada (2018-2019). There I was introduced to isotopic techniques to quantify phagotrophy while I continued my work on carbon budgets and trophic interactions, publishing two first author papers (Cabrerizo et al., 2019a,b). In 2019 I moved to UVigo to work with microzooplankton, and to perform large database compilation and meta-analytical procedures (2019-2022: Juan de la Cierva-Formación & Incorporación), writing 8 articles (Cabrerizo et al., 2020a,b, 2021a,b,c,d, 2022a, b) and four book chapters. Over this period, I did stays in Argentina, UK, Germany, Sweden and The Netherlands.

Recently, I started a 3-year position at Univ. Granada (PAIDI postdoc) where, building on my prior research and applying the analytical skills learnt I am establishing a research line on the role of environmental variability in mediating the impacts of global-change drivers on marine microbial functioning and ecology. I am starting to build my own research group (2 PhD, 1 BSc students on-going; 11 more already supervised) so I am strongly involved in training and mentoring (Cabrerizo et al. a,b submitted, and several others in preparation). Since 2015 I couple my research with a full-time teaching work on fundamental ecology and marine ecology (>630 hs). In 2017, I was awarded with a CEIMAR 2.5-year project, and in 2021 with a AEET-Consolidando Investigación project to address the importance of environmental fluctuations in upwelling coastal ecosystems. I am also a working group member for the World Climate Research Programme. Since 2023, I am leading the TITAN and NINFA projects to disentangle the role of thermal variability in a global-change context in aquatic ecosystems.

Since my first paper in 2014, I have published ~30 articles, 5 book chapters and 2 practical guidelines for undergraduate students (15 as first author), and leaded 7 research proposals. Overall, my scientific experience has consolidated in the field of microbial ecology. I have developed a multifaceted experienced portfolio from physiology to ecosystem's functioning, and I have kept an excelled international research network in the intersection of freshwater and marine ecology fields.

**Resumen del Currículum Vitae:**

Marco earned the PhD in 2017. In 2018, he was awarded with a 1-year grant to continue his work at UGR, and obtained the positive evaluation for Associate Professor from ANECA (National Agency for Quality Assessment and Accreditation of Spain). From 2019-2022, he was a Juan de la Cierva researcher in the Biological Oceanography group at UVigo, and since October 2022 he is back, at UGR, as PAIDI researcher. In 2023, he became a permanent associate researcher at Estación de Fotobiología Playa Unión (Argentina).

Dr. Cabrerizo's research interest are the ecology and biogeochemical role of phytoplankton, in particular the relationship between diversity, and metabolic processes such as photosynthesis, respiration and phagotrophy, and its interaction with grazers (microzooplankton). His approach combines observations during cruises or field campaigns, experiments with microbial plankton communities or ecologically relevant species, remote-sensing analysis, and data meta-analyses. The ultimate goal of his research is to obtain a mechanistic understanding of the linkage between environmental variability, plankton community, and biogeochemical fluxes in the ecosystem.

I am author or co-author > 30 peer-reviewed articles (10 more under review) published in JCR journals, including articles in high impact (IF>10) journals (1 PNAS, 1 Water Res., 4 STOTEN, 2 New Phytol.). I (am) have been principal investigator of 7 research projects (one funded by the 2022 National Plan call), for a total income of > 370000 € I have supervised 9 BSc and 2 MSc to completion, and I am supervising 1 BSc and 2 PhD thesis. Also, I am regular reviewer (40 reviews) > 20 JCR peer-reviewed journals, IPCC reports, and for proposals from funding bodies (NERC-UK, NKKI-EPR-Hungary, FONCYT-Argentina, AEET-Spain), and a review editor for Frontiers in Marine Science.

Most relevant scientific contributions include: determination that mixotrophy is a compensatory mechanism to avoid photo-inhibition by solar radiation in marine surface waters; identification that pulsed resources strengthen microbial interactions; in situ determination of the contrasting thermal sensitivity of microzooplankton grazing pressure in coastal and oceanic environments; quantification of the importance of thermal fluctuations in determine the magnitude of the effects of global warming on microbial plankton; and demonstration that environmental fluctuations deviate the predicted effects of multiple interacting global-change drivers on different biological kingdoms.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | DE SERPA PIMENTEL TEIXEIRA VIANA, DUARTE |
| **Referencia:** | RYC2023-043931-I |
| **Correo Electrónico:** | viana.sptd@gmail.com |
| **Título:** | Ecological processes across scales |

**Resumen de la Memoria:**

I carried out my PhD thesis in Spain (at Estación Biológica de Doñana; EBD-CSIC) with a competitive outgoing fellowship (from the Portuguese national research agency, FCT), having defended it in 2014. After a period of postdoctoral activity in Spain, I moved to Germany in the beginning of 2017, to the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, as a postdoctoral researcher (Humboldt Fellow) to work for two years on a project awarded competitively to me. Then I was funded for another two and a half years to work on a synthesis project as an individual postdoctoral researcher at sDiv (Synthesis Centre of iDiv, Germany). In July of 2021 I came back to Spain (to EBD-CSIC) to first work as a postdoctoral researcher in a project aimed at mobilising biodiversity data and then as a Juan de la Cierva Incorporación. Currently, since September of 2023, I am working at the EBD-CSIC as a postdoctoral MSCA Fellow. My research focuses on understanding the ecological processes underlying biodiversity distribution across spatiotemporal scales and levels of biological organisation, and how these processes interact with global change drivers to determine biodiversity change. This overarching objective contemplates four main lines of research. (1) Movement and dispersal (ecology of individuals): I study how the movement of individuals among habitat patches, between populations and communities (dispersal), allows populations and species to respond fast to environmental fluctuations and change. I have been particularly interested in long distance dispersal as a key response mechanism to global change, allowing species to adjust their distributional ranges. (2) Demographic processes (population ecology): I aim at understanding how environmental fluctuations and change affect the demographic processes underlying population dynamics. To this end, I keep a close collaboration in a long-term project (running for 17 years now) to study a population located on the edge of the species distribution range and whose productivity is subjected to strong annual climatic fluctuations. (3) Community assembly processes (community ecology): my goal in this line of research is to understand how fundamental ecological processes (niche responses, biotic interactions and dispersal) play out to determine community assembly and metacommunity dynamics at local and regional scales. I have been contributing to the development of metacommunity theory, investigating the relative importance of ecological processes across spatial scales, and developing methods and tools to infer processes from observational data. (4) Biogeographical processes (biogeography): I strive to understand how global change interacts with ecological processes and species traits to determine changes in the ecological niche and geographical distribution of species.

**Resumen del Currículum Vitae:**

After the completion of my PhD thesis (in 2014), I have worked in several research projects and have been awarded three competitive projects (Humboldt Fellowship, sDiv individual postdoc, MSCA Fellowship) and a Spanish competitive postdoc position (the Juan de la Cierva Incorporación). I have obtained ~82K Euros of funding directly awarded to me for research activities (excluding salary). Overall, I have published 33 peer-reviewed articles (in WoS-indexed journals), 18 as first author, which have accumulated 1633 citations (H-index = 17, according to Google Scholar). My international collaboration is reflected in my participation in three international working groups (sTURN working group, sCom working group and SOURCES working group). I am an active participant in these working groups by attending international workshops and meetings and contributing to their research goals, including research tasks and writing of scientific articles. I have also participated in two international projects by leading specific research tasks, and many of my publications (18 of 33) are co-authored by international researchers from different countries around the world, some of whom I maintain active collaborations. I am increasingly active in engaging with organisations related to natural resources and biodiversity conservation. I collaborate since 2012 in a long-term scientific and monitoring project in the Canary Islands, and the results, along with conservation recommendations, are reported annually to the pertinent public administration (e.g., Cabildo Insular de Lanzarote). I have also participated in other contracts directly related to conservation planning and technology applied to biodiversity monitoring, and have been involved in data mobilisation projects. Currently, I am also a member of the advisory committee of the monitoring scheme of the Doñana National Park (at Estación Biológica de Doñana), working closely with researchers, technicians and conservation planners. I am also active in disseminating my research results, including writing popular science articles and blogs, and giving interviews to media agencies and nature organisations. I have also recently participated in a nature documentary, soon to be released. I have taught (as a teaching assistant or invited lecturer) in BSc and MSc programmes during my stay in Germany, and I am since 2022 responsible for the courses "Introduction to R" and "Statistical methods in R" of the Master in Biodiversity and Conservation Biology (Universidad Pablo de Olavide). I have also co-supervised (or currently co-supervising) one early-career postdoc (Oskar Hagen), four MSc students (TFM) and 1 BSc student (TFG); and I'm part of the PhD advisory committee of one PhD student. I do not have a permanent research team (as I do not have a permanent position), but I have led several research teams for specific scientific aims, as demonstrated by my first authorships in publications with diverse teams of collaborators. Regarding evaluation activities, I have reviewed more than 70 scientific articles for several journals, and was part of the evaluation committees for the European Commission (programme Biodiversa+) and four national funding agencies (the Swiss, French, Hungarian and Argentinian research agencies) as grant evaluator.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

**Área Temática:** Ciencias y tecnologías medioambientales
**Nombre:** ROYÉ , DOMINIC
**Referencia:** RYC2023-042824-I
**Correo Electrónico:** dominic.roye@gmail.com
**Título:** Short-term effects of the atmospheric environment on morbidity and mortality

### Resumen de la Memoria:

My research revolves around the relationship between the environment and human health. In particular, I have addressed the question of the effects of the thermal environment on mortality and morbidity, which constitutes a significant problem in the context of climate change. In addition, I focus on atmospheric variables and their spatio-temporal behaviour. All my research work is characterised by assessing and analysing complex relationships from a global change perspective with modern and current data science, a high-level understanding of quantitative and computational geographical methods, and statistics techniques. Thus, interdisciplinarity is central to my whole research.

I am interested in how the environment directly or indirectly influences people's state of health. An understanding of the relationship between environment and health is essential in the current changing environment, particularly in light of the challenge of climate change. One of my greatest research achievements was that, in 2017, I was able to show for the first time that hot nights have significant heat-related effects on mortality (Royé 2017) [Int J Biometeorol 61:2127-2140]. As a result of the international attention and the interest of the international MCC network in this work, I could conduct the study for southern Europe (Royé et al. 2021) [Epidemiol, 32:487-498]. This led to my incorporation into the MCC Network as a member and responsible for coordinating Latinoamerica. Another relevant achievement was the publication of heat-related mortality attributable to recent climate change published in Nat Clim Change (Vicedo-Cabrera et al. 2021), where we showed for the first time that, across all study countries (732 locations), 37.0% of warm-season heat-related deaths can be attributed to anthropogenic climate change. In 2021, I was awarded a research project (2 years, 25.000€) from the Xunta de Galicia. Recently, an important achievement was the invitation to a visiting professor at the University of Florence in November 2021. In 2023, I was hired by the Climate Research Foundation (FIC) as head of the data science department.

My two main research lines are closely interconnected and have helped me to approach different problems with different perspectives and methods. More recently, since my incorporation in the MCC research network, and motivated by the need to obtain daily atmospheric data in health studies, I have started investigating the potential use of climate reanalysis data. In atmospheric science, climatic reanalysis data is used in many climate studies. These data sets are combinations of forecast models and data assimilation systems, which allow corrected global grids of the recent history of the atmosphere, land surface, and oceans to be created. The results show that the estimation of the health effects of temperature, even in areas located far from weather stations (or with none available), is possible with climate reanalysis.

It is my purpose for the coming years to establish new approaches and tools that can be applied to address current problems in the relationship between the environment and human health.

### Resumen del Currículum Vitae:

I graduated in Geography and Hispanic Philology from the University of Cologne and RWTH Aachen University in 2010. After graduation, I initiated my PhD studies in 2010 at the University of Santiago de Compostela, with a predoctoral contract from the Xunta de Galicia. I obtained my PhD in Geography from the University of Santiago de Compostela in June 2015 with a thesis that attained the distinction of Cum Laude. I have carried out research stays at the University of Kiel (Germany) [1 month], the University of Barcelona [1 month], the University of Cantabria [16 months], the University of Porto (Portugal) [24 months], and the University of Florence (Italy) [1 month] as both a pre-and postdoctoral researcher

My research revolves around the relationship between the environment and human health. In particular, I have addressed the question of the effects of the thermal environment on mortality and morbidity, which constitutes a significant problem in the context of global change. In addition, I focus on atmospheric variables and their spatio-temporal behaviour. All of my research is characterized by the use of current data science with a high-level understanding of quantitative and computational geographical methods. Thus, interdisciplinarity is central to my whole research.

Research publications (since 2015): 69 articles (55 JCR: 23 D1, 19 Q1; 21 articles as lead or preferred author) (Cites: 2201/1500, H: 24/20, i10: 38/33, Google Scholar/Scopus) in journals, such as Nature Climate Change. Nature Communications, Lancet Planetary Health, Epidemiology, Circulation, Atmospheric Research, International Journal of Climatology, Earth System Data Science, Environmental Research; 2 books and 17 book chapters (McGraw-Hill, Springer, Elsevier), both in collaboration and independently. Lectures in scientific events: 50 national and international conferences, seminars, and courses, 16 as an invited speaker, in countries such as Austria, Chile, China, Croatia, Denmark, France, Germany, United Kingdom, USA, Switzerland, Portugal and Spain. I should highlight a talk on Visualising Scientific Data: Basic Concepts at the Department of Environmental Health Sciences at the Yale School of Public Health. Research projects: 18, including two international ones and three European ones. I was the principal investigator of two research projects supported by the Spanish Agency for Medicines and Xunta de Galicia (25,000€). I have also been hired as principal investigator by SICE for a traffic management project on the A-8 highway (2016-2017) (2.2€ millions). Advisorship of students: 2 PhD (ongoing), 4 Master Theses, 2 Graduation Theses.

I also have experience in popularising science to different audiences (e.g., secondary school students, the general public, undergraduate students, and researchers of other sciences). Since 2018, I have been an active blogger (https://dominicroye.github.io/) mainly about the programming language R. I am also active on other platforms, such as www.geografiainfinita.com and Twitter. In 2019, I co-authored the first book on the climate and weather of Galicia in 20 years.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | CASTANERA ANDRÉS, DIEGO |
| **Referencia:** | RYC2023-044333-I |
| **Correo Electrónico:** | dcastanera@hotmail.es |
| **Título:** | Reconstructing key faunal changes in the Mesozoic and Cenozoic geological record |

**Resumen de la Memoria:**

My research has been focused on two different lines of research. The main line is the understanding of the vertebrate (with emphasis in dinosaurs) faunal changes that occurred around 145 mya, in the transition between the Jurassic and the Cretaceous. This main line of research have produced the majority of my CV achievements since it is directly linked to the work I have developed at four institutions: during my PhD at the Universidad de Zaragoza (FPU), my two postdoctoral projects (Humboldt, Beatriu de Pinós) at the Paleontological Museum (BSPG) in Munich (Germany) and the Institut Català de Paleontologia (ICP) in Sabadell and currently as a researcher in the Fundación Dinópolis in Teruel. I gained international mobility since the PhD (stay at the Natural History Museum of Lisbon, Portugal) and during the postdoc experience (Stay at the Cultural Office, Paleontology Section in Delémont, Switzerland plus several research visits). This mobility has allowed me to meet many international researchers and build a large network of collaborations. Many of my contributions are related to the study of dinosaur and other vertebrate footprint record in several places around Europe, with emphasis in Spanish, Portuguese, Swiss, or German sites. Thus, I have compiled the largest dataset of vertebrate footprints in Europe from the J/C interval. My contributions have provided significant information about the composition of the Mesozoic ecosystems, with emphasis in paleobiodiversty, locomotion and behaviour of the extinct animals, especially dinosaurs. During my career, I gained independence and leadership as PI of research projects and also as director of several paleontological projects that have allowed the discovery of new unpublished sites and the recovery of a large paleontological collection of vertebrates with hundreds of fossils of these poorly known period. Among the new findings stands out the discovery of one of the largest known and most completed sauropod dinosaurs in Europe. My secondary line of research is related to the understanding of the faunal changes in the Cenozoic (last 65 mya), with emphasis in the Eocene/Oligocene transition. I have documented significant sites in the Ebro and Jaca Basins in Aragón (projects funded by Instituto de Estudios Altoaragoneses and Centro de Estudios del Somontano and contracts with Aragon Government) that are key to document the Eocene/Oligocene transition by the study of the ichnological record. My research uses a multidisciplinary approach combining classical and novel approaches in paleontology, stratigraphy, and sedimentology. Both lines of research aim to understand the faunal changes occurred at both geological limits by the analysis of the ichnological record with innovative software based on 3D modelling. They will also provide information about the paleoecology, locomotion, taxonomy, paleobiogeography and paleoenvironments. Besides, the primary line aims to provide an outstanding improvement in the understanding on the ecosystems at the beginning of the Cretaceous due to the study of the collected fossils and the global scarcity of sites with bones. In addition, transfer of knowledge and outreach activities are also a primary target of my research emphasizing the social interest of paleontology and promoting geotourism in the areas where the sites are located.

**Resumen del Currículum Vitae:**

I defended my doctoral thesis, funded with an FPU grant (Ministry of Education) at the University of Zaragoza. After the PhD I was a postdoctoral researcher at the BSPG in Munich, with a project funded by the Humboldt Foundation (end 2015-2017) and at the ICP in Sabadell (2019-2021) developing a project funded by AGAUR within the excellence Beatriú de Pinós Program. Currently, I am a researcher at the FCTP-Dinópolis in Teruel. I have obtained authorization from ANECA to be Assistant and Associate Professor (2015) and recently (2023) the certification I3 of the Ministry of Education that certifies an outstanding research career. I carried out research stays at the Natural History Museum of Lisbon (Portugal. 3.5 months, Europa CAI/FPU mobility grant) and at the Cultural Office (Paleontology) in Delémont (Switzerland, 2 months, Humboldt Foundation). My research is related to understand the faunal changes by studying the fossilized footprint record in two key geological intervals: 1) the Jurassic-Cretaceous interval; 2) the Eocene/Oligocene transition. I have been able to work sites of international significance and provide new data and ideas on paleobiodiversity, paleoecology, paleobiology, paleoenvironment or locomotion of extinct animals. I have participated in 63 published publications that combine both peer reviewed journals (51), international/national book chapters (5) and popular articles (7). I have led/coordinated 21 as first and 9 as last author (result of my student investigations or projects I led). In Scopus are included 48 publications (20 in the top 25 of more cited, 26 Open Access), the H index is 17, and the number of citations 998. I have participated with 87 communications in international and national conferences, 44 as first author and 6 of my students. I have collaborated with more than 100 researchers from more than 50 institutions. I have participated in 23 R&D projects funded through competitive calls [8 International (2 PI), 15 National (4 PI)], funded by national and international agencies. I have obtained as a researcher about 190,000€ as PI in competitive calls and also 8 contracts for scientific studies and fossil preparation obtaining 20.565€ I have been the director of 19 paleontological research actions (excavation and prospections) mainly in Aragón and Castilla y León and participated in campaigns in Argentina, New Zealand or Morocco. I have worked as a freelance paleontologist including a contract as Scientific advisor for La Rioja Government and in different projects for paleontological surveys (28 projects for 17 companies). I have experience mentoring students at four different universities and I have directed 4 Master and 2 Degree thesis and currently published 5 papers with my students. I have taught at Bachelor's, Master's, University of Experience and Universidad de Verano de Teruel. I have also participated in several dissemination and outreach activities (e.g.: Semana de la Ciencia, Noche Europea de los Investigadores) and in numerous interviews (22) for newspapers, radios, TV in the main national media in relation. I have been chairman and/or organizing and scientific committee in international (ICHNIA, EAVP) and national (SEP, EJIP) conferences. I have been a reviewer for numerous SCI journals (60 verified reviews in WOS) and projects of international societies (eg: Paleontological Society).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | QUINTAS SORIANO, CRISTINA |
| **Referencia:** | RYC2023-044106-I |
| **Correo Electrónico:** | cquintassoriano@gmail.com |
| **Título:** | Social-ecological resilience and biocultural diversity |

**Resumen de la Memoria:**

As my CV shows, I have a strong record of proven ability to work across disciplines and in multicultural environments, to publish a large number of articles in peer-reviewed journals and to present my research in international scientific conferences. I have extensive experience leading research projects, both nationally and internationally, which proves my independence as a researcher working at the interlinkages between natural and social sciences.

My main topic of research is to inform environmental planning by incorporating the ecological, sociocultural and economic value of ecosystem services (i.e. benefits people obtain from ecosystems) into decision-making domains. With this aim, I have a wide background using different quantitative and qualitative methods from ecological and social sciences, including a) geographical information systems and spatial analysis to quantify and map the capacity of ecosystems to provide ecosystem services and to model land use change, and b) sociocultural techniques to explore perceptions and preferences of stakeholders regarding ecosystem services as well as the different values needed for promoting social-ecological resilience. The combination of these methodological backgrounds have allowed me to move into more integrative methodologies to study the dynamics and complexity of social-ecological systems (i.e., bio-geo-physical' unit and its associated social actors and institutions). Along this transition, I have also focused on understanding factors that shape human-nature connectedness and biocultural diversity, i.e., the diversity of life in all its manifestations: biological, cultural, and linguistic. Currently, I have established a new research line on the focus to understand the linkages between biodiversity and cultural diversity (i.e., biocultural diversity), which is demonstrated by the 2 current research projects that I am leading as a PI (EmBraCe – Proyectos de Generación de Conocimiento 2022, y EMERGIA – BioDIV) and my previous project acting as PI (Marie Curie – SCALABLE). My research interest and experience working in collaboration with local communities has influenced my transdisciplinary profile, pushing me to explore and use social and natural science methods to study the mechanisms to transition toward sustainability and resilience of social-ecological systems.

**Resumen del Currículum Vitae:**

Through my academic and professional career, I have contributed to fill the gap between social and natural sciences research by conducting studies on sustainability of agroecosystems and investigating new land management strategies that satisfy human needs without compromising the functioning and structure of natural systems.

I earned in 2011 a bachelor in Environmental Sciences, with a strong interest on the ecological and social dimensions of Global Change, and a master degree in 2012 on Global Change Monitoring and Assessment at the University of Almería. In 2016, I completed a PhD in an Environmental and Applied Sciences program at the University of Almería focused on Ecosystem Service Assessment and Sustainability Sciences. During my PhD training, I did complete an international research stay at the Stockholm Resilience Center (Sweden, 2015) and as a postdoctoral researcher at the Catalan Institute for Water Research, ICRA (2019, Spain). At the end of 2016, I obtained a two-years postdoctoral position to start working at the Idaho State University (USA). In 2018, I was granted a Juan de la Cierva Formación fellowship from the Spanish Ministry for Science and Innovation to work at the IMIDRA (Madrid), position that I turned it down to start a postdoctoral contract with the Chair of Social-Ecological Interactions in Agricultural Systems at Kassel University, Germany. Later in 2021, I was granted a Atracción de Talento Postdoctoral fellowship from the Andalusian Government which I enjoyed for 6 months at UAL. Later I lead as PI the SCALABLE project "Social-ecological pathways and gender perspectives for future conservation of biocultural mountain agroecosystems" funded by a Marie Skłodowska-Curie Actions from the European Union's reference programme for two years. Recently, I have earned the Senior Postdoctoral Fellowship EMERGIA from the Andalusian Government, to fund during the next 4-years my BioDIV project "Fostering social-ecological resilience to preserve biocultural diversity in rural Spain" and a project of Generación del conocimiento 2022, the EmBraCe project "Evaluating biocultural diversity and social-ecological vulnerability for conserving rural areas in Spain".

My research experience includes a total of 61 research publications, including 3 books, 5 book chapters, 10 outreach publications and 43 articles in peer-reviewed journals (37 articles published in SCIE journals or SSCI journals; 24 in Q1 journals; 19 published as open access). I was co-editor of two special issues for Journal of Arid Environment and Agriculture. I have presented my research in more than 50 scientific conferences, and I was invited as keynote speaker in 1 conference. I have collaborated in 10 R&D&I competitive national and international projects and 3 research contracts with environmental companies. During my academic career, I have received external funding for more than 550,000 euros; 179,000 Euro to coordinate a two-year project from the Marie Skłodowska-Curie Actions (2021-2023); 257,008 Euro to coordinate as PI of an EMERGIA contract by the BioDIV project (2023-2027); 176,250 Euro to coordinate as PI of the EmBraCe project from the Proyectos de Generación de Conocimiento 2022 (2023-2027); and 182,000 Euro as co-PI of a PRIMA research grant (ConServeTerra project, 2020-2024). I envision my future with the plan of developing an interdisciplinary research program on socio-ecological analysis and biocultural diversity focused on agri

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | ROCA MARTÍ, MONTSERRAT |
| **Referencia:** | RYC2023-045355-I |
| **Correo Electrónico:** | Montserrat.Roca.Marti@uab.cat |
| **Título:** | Quantifying the ocean biological carbon pump using natural radionuclides |

**Resumen de la Memoria:**

My research focuses on the study of the ocean biological carbon pump (BCP), a key component of the Earth's carbon cycle which strongly influences atmospheric carbon dioxide concentrations, the distribution of chemical species in the ocean, and food-webs from phytoplankton to fish. Yet, the BCP is poorly constrained and there is a limited understanding of how it will respond to ongoing and future climate change, underlining the critical need for accurate estimates of the BCP so that downstream effects on global climate and marine ecosystems can be better understood and predicted. My research focuses on using natural radionuclides (e.g., thorium-234 and polonium-210) to quantify the largest component of the BCP, i.e., the sinking particle pump. I have built my career by identifying and addressing the most important knowledge gaps related to the BCP and by working closely with international collaborators across different disciplines.

During my doctoral studies at Universitat Autònoma de Barcelona (FPU fellowship, Spanish Government; 60,250€), my research focused on filling critical gaps in the understanding of the BCP in the polar oceans and resulted in 3 papers as 1st author. My PhD studies included research stays at the Alfred Wegener Institute in Germany (funded by the Spanish Government; 5,960€) and Edith Cowan University (ECU) in Australia. I defended my PhD thesis in July 2017 (Cum Laude, International Doctorate Mention). My postdoctoral career began at ECU (Endeavour Research Fellowship, Australian Government; 11,840€) where I led a new research line on methods development to improve the application of radionuclides as BCP tracers, resulting in 1 paper as 1st author. In 2018, I started a postdoc at the prestigious Woods Hole Oceanographic Institution (WHOI, USA) to lead the particle team and the application of a radionuclide pair (210Po/210Pb) as part of the largest interdisciplinary BCP project ever conducted, EXPORTS (funded by NASA, 20 PIs). I have contributed to many of the papers published so far from EXPORTS (1 as 1st author, 7 as co-author +1 in review), most of them published in the high-impact peer-reviewed journal Elementa: Science of the Anthropocene (JIF 6.1). In 2021, I moved to Dalhousie University (Ocean Frontier Institute International Postdoctoral Fellowship, OFI, Canada; 108,500€) to lead the radionuclide and particle team in a new interdisciplinary BCP project focused on the changing NW Atlantic (NWA-BCP, funded by OFI, 18 PIs). I undertake a leadership role in all phases of EXPORTS and NWA-BCP, including the leading of synthesis working groups, which is allowing me to build a strong and expansive international professional network at the forefront of ocean carbon research. I am currently at ICTA-UAB (Beatriu de Pinós Postdoctoral Fellowship, Generalitat de Catalunya; 144,300€) where I aim at bringing together traditional and emerging methods for quantifying the BCP.

**Resumen del Currículum Vitae:**

Over my career, I have worked closely with international collaborators across different disciplines and been at sea for 10 months as part of interdisciplinary science teams in 8 oceanographic expeditions. I have conducted research in 4 institutions abroad, including 5 years of postdoctoral experience (Canada, USA, Australia). I have been awarded a number of highly-competitive fellowships (>330,000€) and have participated in 15 research projects including 9 international projects (e.g., funded by NASA, Ocean Frontier Institute, National Science Foundation, Australian Antarctic Division, French National Research Agency, European Community). As an example of the international recognition of my research, I have recently been invited to contribute to the number 1 journal in Oceanography (Annual Review of Marine Science, JIF 17.3) with a review paper as an expert in the use of radionuclides as tracers of the BCP (Roca-Martí and Puigcorbé 2024).

I have published 24 papers (+1 in review) in high-quality peer-reviewed journals (all in Q1 journals) and 2 book chapters, including 6 as 1st author and 8 as 2nd or 3rd author. With more than 850 citations, my h-index is 12/14 (Web of Science/Google Scholar) and my median citation percentile is 83rd (WoS Author Impact Beamplot, 2013–2020 publications). I have contributed to more than 20 international conferences and workshops, including 14 presentations as 1st author (2 as invited speaker in Hawaii and Germany). I have also participated in seminar series organized by active scientific communities working in the ocean carbon cycle field (e.g., Ocean Carbon & Biogeochemistry, >100 attendees), as well as seminars organized by academic institutions (e.g., University of Bologna, Duke University, Alfred Wegener Institute). I frequently serve as a reviewer for a wide range of international journals (e.g., Communications Earth & Environment, Frontiers in Marine Science, Progress in Oceanography). I have presented the findings of my research to diverse audiences through different channels (e.g., hands-on laboratory workshops, TV, radio, blogs, social media).

I have significant teaching experience (340 hours) and have directed 5 Bachelor's degree final projects (+1 ongoing) at the UAB. I am strongly committed to the mentoring and training of PhD students in USA (WHOI), Canada (Dalhousie), and Spain (ICM-CSIC), including training in new analytical techniques and continuous guidance on data analysis and presentation of results. I am part of evaluation committees at ICTA-UAB (e.g., Master Thesis Committee; PhD students' Annual Follow up Commissions; Best PhD Dissertation Prize) and have participated in the MIT/WHOI Joint Mentoring Program. I hold the lecturer and associate professor accreditations by AQU Catalunya (Catalan University Quality Assurance Agency, 2021–2022).

**Resumen de la Memoria:**

In my future research, I will dedicate my efforts to deepen our understanding of the local impacts of global climate change. By targeting the most vulnerable and sensitive areas, my research paving the way for more effective adaptation and mitigation strategies tailored to these high-risk areas. I aim to reconstruct past seasonality variations in the Mediterranean area using the novel ∆47-ostracod paleothermometer I pioneered. My plan is to apply the ∆47-ostracod paleothermometer to multiple lacustrine records from various Mediterranean climatic areas, aiming to reconstruct the evolution of seasonality across different geographical regions. The ultimate goal is to create a seasonality map of the Mediterranean during the Last Glacial Maximum (LGM). I intend to concentrate on these temporal intervals as it encompasses rapid climatic events that can be used as modern analogue to validate the precision of climate models. To reconstruct accurate past seasonality using the ∆47-ostracod paleothermometer is fundamental to know the lifestyle of the ostracod species used for the ∆47 analyses. My future work will be focused on increasing the knowledge about the timing of ostracod shell precipitation and their species-specific δ18O offset by monitoring several lakes in the Mediterranean area. The primary objective is to establish an open-access dataset that will facilitate the accurate application of the ∆47-ostracod paleothermometer. Expanding the application of the ∆47-ostracod paleothermometer to marine environments is crucial for bridging the gap between global climate changes and their regional impacts. Two research projects are already on going. The first collaboration is with the AMGC-VUB lab and entails applying ∆47 analyses to marine ostracods from a Middle Pleistocene section in southern Italy. This research contributes to a more accurate understanding of paleotemperature and paleo marine circulation in the Mediterranean. The second one is made in collaboration with the University of Münster, (Germany) and the University of Roma Tre. This research seeks to reconstruct marine environmental conditions on the NW Shelf of Australia (IODP-U1463 site) since the middle Pliocene. These initial two projects focus on determine the accuracy of the ∆47 signal in marine ostracods for reconstructing past T and assess whether a vital effect influences the ∆47-ostracod signal. The outcomes will serve as a foundational study for future applications.

To reach the most arid and hot regions in the planet I aim to apply clumped isotope on sabkhas (flat, and arid environments characterized by the accumulation of evaporitic minerals such as gypsum, halite, and calcite). Terrestrial carbonate archives in arid and hot regions are very rare due to the absence of precipitation and water bodies. Sabkha sediments stand out as unique means to reconstruct past atmospheric conditions (i.e., very-close-to air temperature and precipitations) making them particularly crucial for the studying of such sensitive and vulnerable climatic regions. Currently, there is an ongoing collaborative study with the University of Utrecht and the University of Münster, demonstrating the potential of carbonate sabkha sediments to accurately reconstruct current environmental T. Expanding this research to diverse geographical areas aims to offer insights into extreme climate conditions.

**Resumen del Currículum Vitae:**

I am a researcher focused on paleoclimatic and paleoenvironmental reconstructions using a multiproxy approach (i.e., geochemistry, micropaleontology, and sedimentology) on both marine and continental sedimentary records. My educational background lies in the broad field of geology. Since February 2023, I have been a fellow postdoc at the University of Granada.

I have pioneered the development of the novel ∆47-ostracod paleothermometer designed for lacustrine environments able to provide absolute temperature and hydrology in continental environments. This novel proxy gained widespread recognition, drawing the attention of numerous paleoclimate research groups. I have received 2 invitations as keynote speaker at international conferences and 7 at departmental seminars. I was also invited to participate to 4 International Continental Scientific Drilling program (ICDP) workshops, and I am now part of 4 ICDP and 1 IODP projects in which the ∆47-ostracod thermometer will be applied.

In 2019 at Imperial College, London, I worked on the finalization of the first IBEX Protium Ms instrument designed for the measurement of carbonate clumped isotopes. In 2020, in almost 6 months, I have successfully completed setting up a new state of the art carbonate clumped isotope laboratory at the Vrije Universiteit Brussel. This is the first clumped lab in Belgium. Currently, I am in process of setting up a third lab at the University of Granada, Spain.

I have a total of 17 publications of which 7 as first author and I have submitted more than 36 first-author conference abstracts.

I demonstrate my leadership, independence, and ability to develop new research lines, being PI of 9 international projects and team member of other 10 projects. I wrote 6 successful research grants and 5 travel grants for a total of 324,500 euro. I have an extensive experience in supervising students and teaching.

I have a very high degree of internationalization and mobility since I worked and lived in 5 different countries in the last 12 years, and I have 5 years of international postdoctoral experience outside the country of my Ph.D. I have developed a large, diversified, and international network.

I have taught 12 specialized courses in French, English and Spanish for a total of 804 hours in 4 universities (University of Geneva, Imperial College London, Vrije Universiteit Brussel and University of Granada). In October 2020, I teach a short course about "The use of Ostracod as Paleoclimatic proxy" at University of Costa Rica. In May 2023, I taught a section titled "Paleoclimate and paleoenvironmental reconstruction using lacustrine archives" at the archeological summer school, University of Trento, Italy.

I have been in the scientific committee of the IAS meetings since 2021. I am Chair/co-convener of 10 lacustrine sessions in international conferences. I am in the organizing committee of European Ostracodologist Meeting 2024. Since 2022, I am an Early Career Scientists Committee Member of the International Association of Sedimentology (IAS). Since 2022, I am member of the International Research Group on Ostracod (IRGO) Constitution Working Group. From 2020 to 2023, I was the secretary of the Ostracod group of The Micropaleontological Society (TMS).

I am co-founder and member of the steering committee of a Diamond Open Access journal in sedimentology called Sedimentologika.

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | CARRERO ROMERO, SERGIO |
| **Referencia:** | RYC2023-045291-I |
| **Correo Electrónico:** | sergio.carrero@idaea.csic.es |
| **Título:** | Structural resolution and environmental significance of impure nanominerals |

**Resumen de la Memoria:**

My research aims to understand metal and contaminant behavior in the rock-water interaction, specially in areas affected by mining and industrial activity, to characterized the mechanism controlling the metal mobility and implementation of remediation mechanism based on waste recycling or encouraging natural attenuation processes. I am also interested in the structural and surface characterization of nanocrystalline materials formed in those contaminated areas, and their revalorization as contaminant scavenger in degraded landscapes and potential source of critical raw materials.

In 2011, I started my PhD with FPU grand from the Ministry of Education, Science and Sport. This research focused on chemical and structural characterization of nanocrystalline minerals formed in streams affected by Acid Mine Drainage (AMD) and their interaction with metals and contaminant in solution. These results showed the unknown mechanism of hazardous elements (i.e., arsenic, selenium and chromium) remobilization in AMD by Fe and Al nanominerals newly formed, contributing to identify the natural attenuation processes working in systems affected by acid water. These results were exposed in 4 international meetings, two of those as invited and keynote speaker; and national conferences, where I obtained the award to the best talk in SEM conferences 2015.

In June 2017, I got a highly competitive postdoctoral fellowship from National Science Foundation (USA) at the University of California Berkeley. This research was focused in weathering profiles in sulfide shale rocks and subsequent metal mobility throughout the weathering profile and excursion to ground and surface water, applying synchrotron techniques and computational models. The results elucidated the pH/Eh condition in which the shales act as sink or sources of metals and contaminants since the last glaciation, allowing the construction of reactive transport model, able to predict the effect of climate change (oxygen in water, water table position, temperature, etc.) in weathering reaction. In addition, I was able to identify how exogenous factor (i.e., distances earthquakes) affect in metal excursions in mountain watersheds.

Currently, I have been awarded with the "Talent attraction" Severo Ochoa grant at the Institute of Environmental Assessment and Water Research (IDAEA-CSIC). In my new position, I am implementing my knowledge in synchrotron radiation, lab research and computational models in the understanding of nanomineral influence in metal behavior at the estuaries. In this critical environment, redox conditions, ionic strength tidal effect and micro and macro organism activity affect the behavior and distribution of heavy metals coming from rivers affected by AMD. My research aims to understand how surface properties of Fe and Al nanominerals formed in AMD are affected by estuarine conditions enhancing or reducing their properties as contaminant scavenger.

Moving forward, I'm interested in extending my previous and current research by (i) the revalorization of the waste from acid water treatment plants as sources of critical raw materials, (ii) reusing of those waste as tramp substratum in contaminated soils, and (iii) the possibility to implements these wastes in the treatment of the new recalcitrant organic contaminants.

**Resumen del Currículum Vitae:**

I am an environmental geochemist with a broad range of interests, including metal behavior, nanomineral characterization and surface properties identification by implementation of cut-edge technologies as synchrotron radiation. I did my PhD at the UHU (2016), funded by the FPU fellowship, which was awarded with the maximum qualification (outstanding Cum Laude) and the SEM best PhD Dissertation (€2k). Overall, I had almost 4 years of international experiences, including two tops research institutions. 1) I obtained a postdoctoral fellowship from the NSF (USA, $ 265k) to work at the UC Berkeley (USA, 2 years) where I implement for the first time micro XRF mapping to characterize weathering reaction in rocks showing critical trace element reactions in the context of climate change, 2) I started a project scientist contract at the LBNL (USA, 2019, 1.2 year), being leader of geochemical division and leading a small group of people. Currently, I am working at the IDAEA-CSIC (Spain, 3.2 years) after obtain a "Talent Attraction" postdoc fellowship (€72k), included in the Severo Ochoa grant, working on metal recovery from mine waste and circular economy. I implement synchrotron radiation to characterized waste deposit and optimize raw material recovery. I maintain active collaboration with all my previous institutions and also participate in other international collaboration with researchers at University of Bern and University of Bristol. I have published articles as main author in high impact journals in all stages, including short stays, demonstrating my independence (>80% of the papers published without any of my PhD supervisors) and scientific capacity. My research output includes a total of 27 SCI articles, 21 of them in journals belonging to Q1, and 11 of those in D1. I am first and corresponding author of 7 and second author of 7 of those articles, including top journals like Nature Communication (IF: 16.6), Journal of Hazardous Materials (IF: 7.65) and Environmental Science and Technology (IF: 7.15), where rarely my research area can publish. My publications have been cited 627 time with a h-index of 14 according to WoS and 898 times with a h-index of 17 according to Google scholar. Also, I am first author in 1 and co-author in 3 book chapters. I have participated in >35 conferences (16 talks of which 1 as invited speaker and 1 key note). I have participated in 10 national and international projects funded through competitive calls (e.g. EIT Raw Materials, AEI, DOE), being PI in 3 of those. I proved the ability to attract competitive research funds through (i) the obtention of several prestigious fellowships and projects as PI (FPU, Nano-Espagne, NSF-USA, Sinergia, SNSF, €732k), (ii) being involved in the writing and execution of research projects (EMPATIA, TRAMPA, SFA, €421k) (iii) through competitive application of synchrotron projects (12 as PI, €650k). Finally (iv) Participating in 4 R&D&I transference contracts with international companies (Chevron, CODELCO, EMED, €162k), in all my career steps. Also, I have an extended mentoring experience supervising 3 master theses, 3 undergraduate theses and 2 PhD student. Finally, I have an extended national and international teaching experience with more than 140 hours as associated professor in the Geology and Chemistry degrees given at Spanish and American universities

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | PADULLÉS CUBINO, JOSEP |
| **Referencia:** | RYC2023-044847-I |
| **Correo Electrónico:** | sumvermis@gmail.com |
| **Título:** | Ecological and evolutionary determinants of plant community assembly |

**Resumen de la Memoria:**

I am a plant macro-ecologist and biogeographer. I aim to understand the ecological and evolutionary determinants of plant diversity and its composition at different scales and habitats. I use evolutionary relationships between plant species (phylogeny) and their functional traits to understand the processes that shape communities and ecosystems.

In my research, I combine different subfields of natural and social sciences, phylogenetics, and quantitative analyses to go beyond traditional studies. During my Ph.D. at the Department of Geography of the University of Girona in Spain (2011-2015; FPI fellow), I conducted the first study on the socioeconomic drivers of plant diversity and composition in private urban landscapes in Spain. I worked collaboratively with Drs. James B. Kirkpatrick (University of Tasmania) and Sarel Cilliers (North-West University), two world leaders in urban ecology. My experience in urban ecology opened the door to a postdoctoral stay at the Department of Ecology, Evolution, and Behavior of the University of Minnesota in the United States (2017-2019). During my time in Minnesota, I examined the role of macroclimatic and socioeconomic factors in driving plant diversity and composition in urban residential landscapes at the continental scale. I conducted my work under the supervision of Drs. Jeannine Cavender-Bares and Sarah Hobbie. I specialized in phylogenetics and community assembly processes.

In 2015, I worked as a postdoctoral research fellow at the Department of Ecology of Lincoln University in New Zealand (2015-2016). Here, I studied the impact of plant invasive species on community-level flammability under the supervision of Dr. Tim Curran. Importantly, this postdoctoral appointment was supported by an ERASMUS Mundus fellowship I obtained from the European Union (14.000€). In 2019, I started my postdoctoral position at the Department of Botany and Zoology of Masaryk University in the Czech Republic (2019-2022). Under the supervision of Dr. Milan Chytrý, a renowned botanist in Europe, I consolidated my role as a plant macroecologist studying the spatial patterns and environmental drivers of plant phylogenetic and functional alpha- and beta-diversity in forest communities.

Since 2022, I have been a postdoctoral associate at the Centre for Ecological Research and Forestry Applications (CREAF) in Spain (2022-2024) under the supervision of Dr. Javier Retana. My position is supported by a 3-year Beatriu de Pinós fellowship funded by the Catalan Government (144.300€). I am also an associate professor at the Department of Animal Biology, Plant Biology, and Ecology of the Autonomous University of Barcelona. I teach Botany, Phanerogam Diversity, and Systematics to undergraduates of Biology and Environmental Biology.

My research in the medium term will investigate how past and current impacts of interacting global change drivers (e.g., warming, drought, atmospheric nitrogen deposition, land fragmentation) have affected the diversity and composition of Mediterranean forested landscapes. In addition, I will use fine-scale data to explore how weather fluctuations shape year-to-year dynamics and plant species composition in forest communities and how this variation affects plants with different life histories.

**Resumen del Currículum Vitae:**

Publications:
Over my research career, I have published cutting-edge science in highly prestigious journals (e.g., New Phytologist; Global Ecology & Biogeography; Ecography; Journal of Ecology; Journal of Biogeography; Landscape & Urban Planning; Nature Plants; etc.) using field data collected by myself, analyses of big ecological datasets and modeling.

H-index: 14/18 (Web of Science/Google scholar)
Total citations: 394/657
Total SCI articles: 43
D1 SCI articles: 13 (30%)
Q1 SCI articles: 28 (65%)
Q2 SCI articles: 13 (30%)
First-authored SCI articles: 21 (49%)
Sole-author SCI articles: 1
SCI articles without Ph.D. and postdoc supervisors: 9
SCI articles between 2021-2024: 30 (70%)
Books: 1

Conferences:
Contributions to international conferences: >25
Contributions to national conferences: 4
First-authored contributions: 16

Projects:
Total projects: 10

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

PI in projects associated with competitive fellowships: 3 (Erasmus Mundus: 14.000€; Beatriu de Pinós: 144.000€; Maria Zambrano: rejected due to incompatibility with another fellowship).

Reviewing activities:
Articles reviewed for SCI journals: 40 (e.g., Global Ecology & Biogeography; Landscape & Urban Planning; New Phytologist)
Ph.D. theses reviewed: 2 (Universitat de Girona)
Projects reviewed: 1 (Czech Science Foundation)
Associate Editor for the Journal of Vegetation Science

Mentoring:
Finished: 1 MSc thesis in Lincoln University (Robin Pieper)
Ongoing: 2 PhD theses at Masaryk University (Joshua Erkelenz & Gonzalo Velasco); 1 MSc thesis at the University of Girona (Mar Fuste)

International experience:
Predoctoral: 6 months: University of Tasmania, Australia (4 months); North-West University, South Africa (2 months)
Postdoctoral: 5 years and 4 months in three institutions on three continents: Lincoln University, New Zealand (6 months); University of Minnesota, USA (24 months); Masaryk University (34 months).

Accreditations:
Tenure track: " Ayudante doctor"  (AQU), " Professor lector"  (AGAUR)
Researcher: i3 (Ministerio de Universidades).

Teaching: 179 hours. Main subjects: Botany (Biology); Biology and Diversity of Phanerogams (Environmental Biology); Animal and Plant Biology (Genetics); Integrated Laboratory (Genetics); Vegetation analysis and mapping (Biology); Natural Heritage and Environmental Problems in Europe (Geography).

Outreach & Dissemination:
8 workshops or talks with the general public
4 media interviews
Member of the CREAFtalks organizing committee at CREAF

**Resumen de la Memoria:**

I am a marine biologist specialist in systematics, biodiversity and trophic ecology of marine invertebrates. As a mature and accomplished scientist, I actively seek for new exciting and challenging evolutionary questions based on my excellent biological and natural history knowledge, and link different disciplines in innovative ways. For that, I adapt and combine highly specialized and cutting-edge approaches. As an example, I pioneered the combination of laser-capture microdissection (LCM, a method mainly used in biomedicine, such as cancer research) with DNA metabarcoding for assessing the gut content of tiny animals, which is an important milestone and technical development for the field of molecular trophic ecology.

I greatly contributed to solve cephalopod and nemertean systematics and taxonomy, including detecting new and solving old-problematic cryptic biodiversity species complexes through multidisciplinary approaches and cutting-edge molecular methods, including providing new diagnosis based on both morphological and molecular characters (specific nucleotide positions, and/or evolutionary gene rearrangements). My -omics work on cephalopods helped to elucidate its evolutionary relations of the main lineages. As result, I am the largest contributor of cephalopod species mitogenomes with more than 100 novel mitogenomes sequenced so far (85 already published or included in articles accepted for publication). My systematics contributions have provided large contributions as the definition of new specific, genus, tribe, family-group names, as well as providing new taxonomies for both cephalopod and nemertean taxa.

I also lead molecular and stable isotope trophic ecology work on cephalopods and the projects on the challenging identification of cephalopod remains on their predators through their beaks. My discovery of the detritivory during the first days of flying squids answered the century old question about its unknown diet. I also participate in the discovery of the unknown diet of mesopelagic enigmatic organisms (such as glass squids) and unknown ontogenetic phases of species of economic importance, such as the juveniles of common octopus, a keystone species both for artisanal and industrial European fisheries and for coastal habitats.

I repeatedly demonstrated my scientific independence and maturity bringing new research lines lacking in the research groups I was working (e.g., molecular diets, microbiomes, phylogenomics) and methods (e.g., LCM, Genome Skimming), and also furthering long-standing international collaborations with investigators from Japan, Vietnam, Taiwan, New Zealand, India, US, Mexico, Brazil, South Africa, and many European institutions. During my stages in different institutions (Stanford University, NUIG, OIST, MNCN-CSIC, Uniovi), I complemented the ongoing technical and scientific lines, and contributed to expand and improve the research groups scientific goals. As an RyC awardee, I will lead the research line " Use of generalist predators for the characterization of cryptic components of the biodiversity of marine benthic and pelagic environments" . I will characterize cryptic components of marine biodiversity (low trophic levels, parasites, microbiome) combining my previous competences on the field with new cutting-edge -omics methodologies.

**Resumen del Currículum Vitae:**

I have published so far 44 JCR articles (25 as 1st or 2nd author), including relevant D1 journals of the field such as Zool. J. Linn. Soc. and Rev. Fish Biol. Fish. I am also the author of 76 outreach articles, 4 book chapters (one as single author), 5 non-JCR publications and 2 bioRxiv preprints. I presented my research in 36 international and 9 national conferences, including leading conferences of my field as the Cephalopod International Advisory Council 2015, 2018 and 2022 conferences. Currently, I am the co-advisor of 2 PhD students and 2 students (Master and Bachelor), and in the past years I co-advised of 4 undergrad and 5 Master theses (one funded by JAEIntroICU program). My inspiring capability is illustrated by the fact that all 5 undergrads pursued a career in science. I have also provided unofficial training, professional guidance and help for many early career researchers. I am author of a utility model (~patent) for the capture of recently settled juvenile octopus, already published by Oficina Española de Patentes y Marcas. I developed stages in different international (NUIG, Ireland, 24 months; Stanford University, US, 3 months; OIST, Japan, 1 week) and national institutions (MNCN-CSIC, >15 months; University of Oviedo, >4 years). I am the IP of 4 competitive projects funded by the Spanish Government (1 of them a " Plan Estatal" awarded with an FPI fellowship) and the non-profit USA organization Conchologists of America (cumulative value >240K€). I collaborated in 15 additional projects funded by EU, national (2 " Plan Estatal" projects I was part of the Working Team) and regional organizations, with a cumulative value >8,890K€ I participated in 5 oceanic cruises (50 d international and 38 d in national waters). I have reviewed 71 manuscripts for 36 international peer-review journals, one book, and a project (NOAA, Department of Commerce of the US). I was a member of the panel in a PhD viva (University of Vigo, 27-10-2021). I am part of the Editorial Committee of Mar. Biodivers., Zookeys, Biodivers. Data J. and Fron. Mar. Sci.

I collaborated in several research projects involving Catalonian cephalopod fishermen, resulting in authorship of two large reviews on octopus and cuttlefish fisheries published in JCR Q1/D1 journals. Fishermen appreciate the knowledge gained and are beginning to apply improvements. Since January 2023, I collaborate as scientific consultant for the squid tagging scientific monitoring of ScienticAngler, a recreational fishermen association centred on sustainability. I engage with the public by writing lay language articles for broad audiences in English and Spanish, contributing to blog and newspaper pieces, giving talks at schools, higher educational centres and conferences, and participating in podcasts and radio programs. I am one of the main contributors to the outreach journal Asturnatura.com. I am frequently approached by professional and citizen scientists seeking help, guidance and information because of these outreach contributions and I am confident that as a result I create long-standing positive impact on people's knowledge and curiosity towards nature, enhancing their conservation attitudes.

The scientific excellence and the coverage by national Irish radio programs of Fernández-Álvarez et al. 2022 was recognize by the President of the NUIG (Ireland).

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Ciencias y tecnologías medioambientales
**Nombre:** BURRACO GAITÁN, PABLO
**Referencia:** RYC2023-044964-I
**Correo Electrónico:** burraco@ebd.csic.es
**Título:** Physiological causes and consequences of wildlife responses to global changes

**Resumen de la Memoria:**

My research seeks to understand the molecular mechanisms driving the responses of wildlife to global changes, with particular interest on how ectothermic animals cope with environmental variation. I mostly make use of physiological indicators of ageing and health, as a proxy to investigate how environmental and anthropic disturbances impact on individuals, populations and species. Through ecological, evolutionary and developmental (EcoEvoDevo) approaches, I believe I have added novel scientific ideas by combining empirical, field-based, theoretical, modelling, and meta-analytical work. I have developed my research mostly in three international institutions Doñana Biological Station (PhD period and current Juan de la Cierva Incorporación postdoctoral fellow), Uppsala University (first postdoctoral period as a Carl Tryggers fellow), and University of Glasgow (second post-doctoral period, as a Marie Sklodowska-Curie fellow). My main research lines can be summarised as follows: i) the physiological causes and consequences of developmental plasticity, ii) the impact of global changes on ageing-related mechanisms, and iii) how extreme conditions shape animal performance and physiology.

During the next five years, I will integrate my previous experience into empirical, comparative, and modelling work to mechanistically investigate changes in animal health and life histories, as well as population dynamics and species divergence under different scenarios. This research aims to significantly increase our current knowledge in fields such as ecology, evolution, biomedicine, conservation or ecotoxicology. In particular, my future research will have three major objectives: i) to investigate whether environmentally-driven evolution of life histories shapes the ageing process, and the consequences of this process for animal resilience, ii) to understand whether individual stress can scale-up to ecosystem consequences; iii) to examine the causes and costs of animal responses to acute and chronic exposure to extreme environmental and anthropogenic disturbances. To achieve Objective i), I will conduct empirical work inducing the evolution of life histories, including divergent developmental plasticity, and quantifying the impact of that on the ageing process. This will include long-term transgenerational experiments that will quantify ageing both at the organismal and molecular level across tissues and the ontogeny, as well as fitness components. In addition, comparative and meta-analytical work will be conducted in this objective. To achieve Objective ii), I will experimentally investigate whether stress can be transferred between individuals inhabiting the same ecosystem, via the release of stress hormones. This is based on evidence showing that stress hormones are released by organisms via skin, urine or faeces to the environment, and high levels of these hormones have been found in highly stressful scenarios. To achieve Objective iii), I will conduct laboratory and field-based experiments aiming to mechanistically understand the causes and consequences of certain factors (ionising radiation, microplastics, extreme environmental conditions such as wind and temperature) risking animal welfare. Overall, my future research will not only complement my previous work but will include novel approaches to solve outstanding eco-evolutionary questions.

**Resumen del Currículum Vitae:**

Funded by a FPU scholarship, I conducted my PhD at the Doñana Biological Station (EBD-CSIC). My International PhD dissertation was awarded Cum laude and Premio Extraordinario de Doctorado (University Pablo de Olavide, 2017). After the PhD, I got a two-year Carl Tryggers postdoctoral position at Uppsala University (2017-2019). I was then a Marie Curie (MC) fellow at the University of Glasgow (2019-2022). In March 2022, I started a Juan de la Cierva Incorporación position at EBD-CSIC.

Overall, I have 32 publications, including 31 JCR-indexed articles and a book chapter (Burraco and Gabor, 2023 CRC Press), all in Q1 journals, according to scimagojr.com. My publications have got 935 citations (h-index = 14, i10-index = 20). I am the first author of 24 out of the 32 publications –including three co-first authorships–, and the second author in 4 publications. I have disseminated my research in 24 international conferences, including five invited talks: Spanish Association of Terrestrial Ecology 2023, Society for the Experimental Biology Conference 2022, Conference of the Society for Experimental Biology 2022, University of San Cristóbal de Huamanga 2021, and University of Glasgow 2020.

My international experience includes 25 months at Uppsala University (2014, 2017-2019), 30 months at the University of Glasgow (2019-2022) and one month at Texas State University (2023), for a total of 56 months. I collaborate with researchers from 14 countries and 24 institutions. I have secured funding for PhD and postdoctoral positions and projects to develop my own research. Overall, I have been funded for ~420,000€ including ~75,000€ for research. In addition, I have been awarded three travelling fellowships for ~7,000€ Spanish Ministry of Education, Society for the Study of Evolution, The Company of Biologists. I have participated in other six research projects funded for a total of ~700,000€ I got several awards and recognitions such as Professional Development Award by SICB. Burraco & Orizaola 2022 Evol Appl was included within the top papers of the year by Phys.org, and Burraco et al. 2022 Ecography was published within the E4 Award special issue.

I am currently supervising two PhD students, one at the Braunschweig Technical University (Germany, with Katharina Ruthsatz and Miguel Vences) and one at the University of Oviedo (Spain, with Germán Orizaola). I have supervised three master projects and six undergraduate students, including two Honours and two Erasmus+ projects. The master students are successfully developing their careers: PE is a PhD student, JCT is a Biology's teacher (Burraco et al 2023 Evolution), and TN works as an Environmental educator. Both Honours students have started their PhD theses (CM co-supervised by me; Martin et al 2023 Biorxiv).

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I have been committee member in two PhD and one MSc defenses, external reviewer in three PhD theses, and reviewer for the Spanish I+D+i and the Scottish University Partnership for Environmental Research projects. I have reviewed 70 manuscripts for 34 journals. I am also deeply committed with science outreach, having disseminated my work the European Researchers' Night, popular science magazines, school talks, or via X (@pabloburraco). Two publications - Evol Appl 2022 and Global Change Biol 2020- have a very high Altmetric score (1,494 and 155 respectively, both within the 99th percentile).

**Resumen de la Memoria:**

My scientific background is broad, as I have always worked in a transdisciplinary context, but my research line focuses on the study of Late Miocene to Middle Pleistocene fossil small mammals from South Europe, North Africa and South America with the aim of carrying out dating of sites, palaeoenvironmental and paleoclimatic reconstructions and evolutionary analysis.

The studies in which I have been involved have clarified very relevant aspects of the effects of the climatic crises of the last 10 million years on the dispersals of fauna and early humans. Furthermore, my studies have enabled the refinement of chronological frameworks based on fauna in regions spanning across three continents. In terms of discovering new taxa, I have erected 8 new species, proposed 3 new combinations, and established 3 new genera, encompassing taxa from Europe, Africa, and America.

My interest in reconstructing Plio-Pleistocene continental paleoenvironments and exploring the implications of climate change for early hominin dispersals has led me to participate in international scientific teams studying sites that document the earliest human migrations out of Africa, such as Dmanisi (Georgia) and Orce (Spain), as well as sites in North Africa, like the Ain Beni Mathar basin (Morocco). In addition to Georgia and Morocco collaborators, I am working with scientific teams from Argentina, Italy and France.

My scientific track record has allowed me to build a solid network of international collaborations, necessary to move forward and continuing leading and ambitious and exciting richer line: to carry out a multiproxy approach for the reconstruction of continental paleoenvironments from the Plio-Pleistocene and its implications for the earliest hominin dispersals into the western Mediterranean.

This research line involves the study of the evolution of small mammal communities in the Plio-Pleistocene of the western Mediterranean, since this group is a useful tool for paleoecological and paleoclimatic reconstructions. However, these reconstructions could reflect local shifts in environments instead of global or regional climatic trends. Therefore, it is interesting to contrast high-resolution paleoclimatic records from small mammal assemblages with an independent proxy as are geochemical approaches based on stable isotopes. This multiproxy approach will be applied to a number of key-sections from Spain and northern Morocco (Orce, Quibas, Guefaït, etc.), which are tied to a high-precision chronology and are particularly significant regarding the earliest hominin dispersal into the western Mediterranean. This line also includes the study of the Georgian Dmanisi site, which record the oldest Eurasian hominins. The innovative nature and originality of the proposed research lies in combining paleoecological data inferred from small mammal assemblage methods with geochemical approaches. The research line has a marked interdisciplinary and multidisciplinary nature, since it involves the integrations of knowledge and methods from a variety of fields such as geochemistry and biology applied to paleontology. The expected scientific impact is high because the proposed topic is of great interest for current research and nowadays society. The originality and innovative aspect of the research proposed here provides a solid basis to ensure a significant scientific impact

**Resumen del Currículum Vitae:**

In July 2017 I obtained my PhD in paleontology (Cum Laude) thanks to a FPU predoctoral fellowship at the Institut de Paleoecologia Humana i Evolució Social (Tarragona). In April 2019 I started working at the prestigious Facultad de Ciencias Naturales y Museo (La Plata, Argentina), funded by a 27-month postdoctoral fellowship from the Argentinian CONICET. In June 2021 I was selected through a competitive process for a 2.5 year long postdoctoral researcher position at the IPHES (Excelencia María de Maeztu' program). After being selected by the ' Juan de la Cierva Incorporación' program, in March 2022 I signed a 3-year contract at the same institution.

My scientific career includes participation in up to 16 national and international funded projects, 3 of them as principal investigator (PI). I am coordinator of Paleoecology Research in 1 research project from the Spanish Ministry of Science and Innovation. Moreover, I am PI of 2 grant agreements. Since 2014 I am director of the Quibas site (Early Pleistocene, Murcia), leading an important multidisciplinary research team. Overall, as Principal Investigator I have attracted more than 200,000 €through competitive projects and inter-institutional grant agreements.

I recognise that the circumstances and pressures of academia have provided me with a capacity for leadership and independence, which may be evidenced by the 46 articles published in journals with "peer review" I authored, 42 of them in indexed journals with IF, and 4 published in other journals. I am the lead author of 43% of my indexed articles (n=18), second author in 17% (n=7), last author in 5% (n=2) and corresponding author in 45% (n=19). 72% of my papers as first author are published in journals of the first quartile. Following SCOPUS, my h-index = 13, total citations = 366, 70% of the total documents in top 25% (Q1), 36.7% of documents in the top 25% most cited documents worldwide, 40% of international collaboration. My CV also includes 58 abstracts/conference proceedings (leading to 23), 11 book chapters (leading to 8), 4 books (leading to 1), and 5 scientific-technical reports.

I have participated in numerous activities of scientific divulgation such as talks and conferences (18, such as Pint of Science, European Researchers' Night); intervention in documentary films (2); book presentations (5); open days (7); media interviews in radio (9, including RNE, Cadena Ser), print media (28, including National Geographic Magazine), and TV (10, including TVE); press notes (13; impact on >400 national and international digital media); and videos (4). In transfer activities highlights my role as scientific coordinator of a 60-volume collection of divulgation books on human evolution published by Editorial Salvat, and coordinator of a conference cycle funded by Fundación La Caixa.

I am Referee for 9 SCI journals (18 reviewed papers), Reviewer Board Member of MDPI, Member of Reviewer Board and Topical Advisory Panel of the JCR journal Quaternary, Section Editor for the SCI journal Ameghiniana, , and session chief in 1 conference. I supervise 2 PhDs, 7 Degree Theses, 3 Master Theses, 1 laboratory technician and serve as an internship tutor of 5 students. In addition, I have taught at both undergraduate and graduate level. Lastly, in 2023 I obtained accreditation as ' Professor Agregat' issued by AQU Catalunya.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | ÁLVAREZ PRESAS, MARTA |
| **Referencia:** | RYC2023-043807-I |
| **Correo Electrónico:** | coseseries@gmail.com |
| **Título:** | Analysis of soil invertebrates using phylogenetic and omics tools |

**Resumen de la Memoria:**

I am an evolutionary biologist who began her scientific career with a fascination for the enigmatic world of flatworms, an unknown diverse group of invertebrates that possess deep evolutionary insights. My doctoral thesis delved into the phylogeny and phylogeography of land planarians, exploring their evolutionary relationships and illuminating their distribution patterns in the Brazilian Atlantic Forest and the Iberian Peninsula.

During my doctoral studies, I acquired a set of skills spanning morphological analysis (taxonomy), molecular analysis (population phylogeny and genomics), field sampling, and computational data analysis. This experience has established me as a respected researcher in the field of evolutionary biology.

After earning my PhD, I used cutting-edge NGS techniques to unlock the genomic secrets of soil invertebrates. These efforts resulted in the assembly of a flatworm genome and metagenomic analysis of their dietary preferences.

My postdoctoral research further expanded my horizons and focused my attention on the broader scope of animal evolution. I delved into the genomic composition of the origin of Bilateria, tracing the evolutionary paths that led to the emergence of bilaterally symmetric animals. Additionally, I investigated gene gains and losses in large evolutionary adaptations, such as parasitism, to gain a deeper understanding of the diversity of life.

My current position has allowed me to delve deeper into the genetic regulatory machinery of unicellular animal relatives, exploring their evolutionary relationships and shedding light on the origins of complex animal biology.

During my academic career, I have consistently demonstrated a commitment to public outreach, attempting to foster a deeper appreciation of scientific research and its impact on society. My dedication to education has also been notable, as I have actively contributed to the training of future generations of scientists through my teaching and mentoring.

My track record of academic achievements, including a significant publication record and broader research impact, demonstrates my ability to conduct independent research and scientific leadership. I have also actively contributed to the scientific community by reviewing articles for numerous journals and being part of doctoral and master's thesis committees.

For the future of my scientific career, I would like to study invasive species at the genomic level. I intend to leverage genomic tools to analyse populations of invasive and native species, identifying the genetic basis of their adaptability and enabling effective management strategies to mitigate their detrimental effects on natural habitats.

My future research program will draw on my extensive knowledge of flatworms, along with my experience in comparative genomics and ecology. By delving into the metabolic interactions, ecological context, and selective pressures that drive the success of invasive species, I aim to elucidate the evolutionary mechanisms underlying their invasive potential.

This ambitious research effort will not only contribute to our understanding of invasive species but will also provide a platform to foster new and existing collaborations, enhance the growth of my research group, and ultimately contribute to promoting the use of scientific knowledge to protect biodiversity and safeguard natural ecosystems.

**Resumen del Currículum Vitae:**

I started my career at the University of Barcelona (UB) as an MSc, where I pioneered the use of land planarians (free-living Platyhelminthes) for phylogeographic studies, exploring evolutionary processes shaping biodiversity and population genetics. During my PhD (granted cum laude in 2012), co-supervised by Profs Marta Riutort and Julio Rozas (UB), I focused on the phylogenetic and phylogeographic relationships between terrestrial planarian species from the Brazilian Atlantic Forest and the Iberian Peninsula (published in Heredity, Journal of Evolutionary Biology, Molecular Phylogenetics and Evolution, Zoologica Scripta, etc., and presented in multiple national and international meetings). I developed my fieldwork skills by participating in multiple sampling campaigns across Europe and Brazil, as well as molecular biology in the laboratory. I also learned histological techniques becoming a taxonomist of the group, describing more than 20 species. Additionally, I have gained extensive experience in computational methods.

After my PhD, in 2014, I incorporated genomic approaches to complement the taxonomic methods, applying species delimitation techniques, and assembling transcriptomes and genomes.

In my second Postdoc (Dr Ruiz-Trillo's lab) in 2019 I developed my bioinformatics skills, analysing metabarcoding data from environmental samples. There I used comparative genomics to answer questions about eco-evolutionary transitions. That led me to my last Postdoc (Dr Paps, UoB) in 2019, where I investigated the origin of parasitism and the ancestral genomic composition of the transition from free to parasitic life.

Both in Barcelona and Bristol, I acquired substantial teaching experience at the bachelor level or superior with ~750h of lectures.

I have extensive international experience, a stable network of collaborators, 33 peer-reviewed publications (9 as a first author and 12 in the last position). I have published in outreach magazines and taught seminars in schools. I have published 8 scientific documents and 2 book chapters. I have been invited speaker at several institutions and participated in numerous conferences (22 oral presentations and 13 posters). I have been a member of symposia organisation committees (ISFB, the most important flatworm conference; and EuroEvoDevo). I am a highly collaborative scientist with the ability to develop an independent research career, leading work in which I have been the main contributor, supervising 3 undergrad (one currently ongoing) and 3 MSc final projects, and advising 6 PhD students. I am currently co-supervising a PhD candidate at the University of Bristol. I have a proven track record of obtaining competitive funding (doctorate grant and funding for trips and stays during and after the thesis, and most importantly, the highly competitive grant ComFuturo, awarded only to 15 researchers in Spain in each call).

During my scientific career, I have had 3 career breaks: two maternity leaves and one for caring for a sick family member. As a result of my last two postdocs, I am working on several manuscripts, which have not yet been published due to the difficulties caused by the COVID pandemic and therefore do not appear in my CV.

Despite my ongoing commitment to scientific growth, I am confident that my current level of scientific maturity aligns with the requirements of a position at RyC.

**Resumen de la Memoria:**

My research deals with the interaction between the atmosphere, the physical ocean and marine life and how the latter influences the global carbon cycle. To this aim, I analyse large quantities of data from various sources, from ocean models to different observational sensors. An excellent example of my diverse and forward-thinking toolbox is the biogeochemical modelling technique I developed during my PhD to reveal the drivers of phytoplankton blooms (Llort et al., 2015) and the response of Southern Ocean primary production to ocean stratification (Llort et al., 2019). Equally innovative was the automated detection of vertical water injections using an array of autonomous robots (Llort et al., 2015). This technique was further improved and applied to two floats I monitored and drove in the Southern Ocean, culminating in a work published in Nature Communications (Lacour et al., 2023).

In 2020, I led an international team to show how iron-rich aerosols from wildfires can boost marine productivity by combining satellite data, atmospheric models and autonomous robots. This study was published in Nature (Tang and Llort et al., 2021, shared first authorship) and set the scene for designing my first relevant project as PI, PYROPLANKTON, funded by the European Spatial Agency (ESA) through a Living Planet Fellowship. This international 2.5-year project investigates the links between wildfires and phytoplankton using satellite data, Earth System Models and ground-breaking laboratory experiments. For the latter, I led a collaboration with 12 Spanish and French researchers in one of the best European experimental infrastructures for aerosol deposition on the ocean in the IMEV lab in France. The experimental and modelling results of the project will be published in two publications that will be submitted during the first half of 2024. An additional outcome of PYROPLANKTON is the organisation of the international workshop FLARE, funded through a competitive call from FutureEarth, that brought together 40 researchers from all the disciplines working on fire science. A white paper is being prepared as a conclusion of this workshop, and early this year, we published a perspective paper on the future of aerosol deposition (Hamilton et al., 2023). My research on the impact of aerosols on marine biogeochemistry also encompasses the impacts of desert dust on marine primary production and carbon export. To this end, I have led the work package on ocean impacts of the DOMOS consortium (coordinated by ECMWF and funded by ESA). The results from this work (manuscript in preparation) show a significant increase in primary production when coupling a state-of-the-art atmospheric reconstruction with an ocean biogeochemistry model.

I plan to develop this line of research further by exploring the use of autonomous floats to capture the influence of aerosols on marine primary production and the biological carbon pump. I will also continue combining atmospheric models with observations and lab experiments to translate the mechanical understanding to modelling parameterization that allows for a better evaluation of the net impact of wildfires on the global carbon budget.

**Resumen del Currículum Vitae:**

I am a Recognised Researcher in the Earth Sciences department at the Barcelona Supercomputing Center. I hold a BSc in Physics from the Universitat de Barcelona (Spain) and MSc and PhD in marine biogeochemistry under the supervision of Dr Marina Lévy, Université Pierre et Marie Curie (currently Sorbonne Université) in Paris, France. I worked as a postdoc at the Institute for Marine and Antarctic Studies (IMAS) in Tasmania, Australia. In September 2019, I joined the Earth Sciences Department of the BSC.

I have published 14 peer-reviewed articles, including one in Nature as the first author (shared with Dr Tang) and one in Nature Communications as the second author. I also have 2 preprints under review, one in Nature Geosciences. Based on Dimensions, I accumulated 409 citations, one-third obtained in 2023, and I am the first author of my three most cited papers. I have also participated in over 20 international conferences (12 with oral presentations and 5 as an invited speaker). I have contributed to attracting more than 450k€ on competitive calls, enjoyed research stays in China, South Africa, and the UK, and spent more than 100 days doing field research at sea. I am currently leading the project PYROPLANKTON to understand the impact of wildfire aerosols on marine ecosystems, and I am the co-PI of the project BIOTA, funded by an AEI's Generación de Conocimiento grant 2022, which seeks to quantify better the iron content in mineral particles exploiting new satellite data (EMITT).

I have supervised one PhD student (R. Patel, PhD obtained in 2020, two publications + one preprint) and an MSc thesis from the Un. Complutense (the thesis was evaluated with a 9/10, and the results were presented at an international conference). I am also a member of the advisory committee of two PhD students, one in Spain (BSC) and the other in France (LOV-SU). I have been a member of the scientific committee of the Joint Effort for the Twilight Zone Ocean Network (JETZON), an international network on mesopelagic studies endorsed by the UN's Ocean Decade. Since January 2023, I have been the chair of the Early Career Scientist Committee of SOLAS, a renowned international network focused on air-sea exchanges. As its representative, I will co-lead an official side event at the Ocean Decade Conference (April 2024, Barcelona).

An additional asset of my research portfolio is an interdisciplinary effort on ArtScience projects. I am leading two ~30k€ projects to produce installations based on ocean data at festivals SONAR and Biennal del Pensament (CCCB) in 2024, and I contributed to a videomapping that showcased ocean model outputs to an on-site audience of about 90,000 people (Structures of Being by Sofia Crespo and Casa Batlló, January 2024). The ensemble of these collaborations is aligned with the EU's recommendations on Open Science practices and contributes to the Ocean Literacy goal of the UN's Ocean Decade. From a researcher career level, I am positioned as a relevant actor in the intersection of culture, art and climate sciences. Proof of it is the invitation to act as scientific advisor of an international consortium for the HORIZON Europe call (Ocean & water and arts) and the invitation by FECYT to participate in the panel Cultura y Ciencia at PUBLICA24.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | MONCUNILL SOLÉ, BLANCA |
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| **Correo Electrónico:** | blanca.moncunill@gmail.com |
| **Título:** | Eco-evolutionary dynamics of lagomorphs in front of past environmental changes: deep-time paleobiological data for the management and conservation of extant species |

## Resumen de la Memoria:

My research focuses on studying the life history and evolutionary dynamics of extinct lagomorphs, to understand how this mammalian order responded to past climate and environmental changes. It will provide long-term dataset to prompt specialized conservation programs and conservationist policies for extant ones.

During my PhD, I have developed the first computational models for reconstructing the body size of extinct small-sized taxa using postcranial bones. Besides, I contributed to describe the generality and causality of island rule, assessing the size evolutionary dynamics of small extinct taxa, and showing the active role of predation release, resource limitation and time of isolation. After my PhD in 2016 (Cum laude and Extraordinary award), I refined my research line towards the evolutionary palaeobiological study of lagomorphs and I moved to 4 different research institutions (specialized in lagomorph taxonomy, environmental reconstruction...) to achieve my goals. In this time, I participated in the description of new species as well as I led the characterization of the locomotion and life history of fossil lagomorphs, determining their ecological role and reproductive strategy, and reviewing their eco-evolutionary responses to insularity. This extensive experience in research (27 JCR papers, 1 under review, 3 in prep, 1 edited book, 2 book chapters, 46 meetings; 72% of leading role, H-index 11/13, 6 inter+national competitive projects as PI, extensive collaborative network, etc. see CVA), coupled with a large teaching profile (>700h) and active participation in outreach projects, are the essential pillars for basing my present research line. Now, my research line of investigation, which breaks up with the classic lagomorph palaeontology, is focused on the determination of evolutionary and ecological dynamics of extinct lagomorphs to past climate and environmental changes. Based on macro- and microscopic analyses, I unveil life history traits of past lagomorphs and evidence trends and shifts correlated to variations in abiotic and biotic factors. Of relevance are body mass, locomotion and diet, because these traits let to evaluate the ability of taxa to persist under particular scenarios of environmental change. Learning how lagomorphs responded to past environmental changes is relevant for addressing the conservation and management of the endangered extant ones, as well as for developing more effective conservationist policies (mission area of the HEU and UN-SDG-15). It is an ambitious, innovative, and ground-breaking project, focusing on the remains of extinct lagomorphs in a pioneered and unique way. The results of the project will impact in the field of Paleontology/Evolutionary Biology, but also in the conservation and Ecology. Firstly, the results will increase the evolutionary knowledge that we have of the order (biodiversity fluctuations, biological strategies and energy allocations,...), understanding better their ecological roles. Secondly, the development of an extensive database about the biological evolutionary responses of lagomorphs to changing environments will be of relevance. Thanks to the study in the deep time, we can know which taxa are likely to persist to particular climatic/environmental scenarios, identifying suitable candidates and locations for programs of managed restoration, relocations, and rewilding.

## Resumen del Currículum Vitae:

I am a palaeobiologist interested in unravelling the biology and evolutionary dynamics of extinct small mammal taxa, particularly lagomorphs. I graduated in Biology in 2010 and obtained the PhD in 2016. I was funded by the FPU Call 2010 and my PhD Dissertation was recognized with the Extraordinary Award and the maximum qualification. Besides, I was awarded the Young Scientist Award of the ISZS (2017). I was an associate professor in the BABVE Dep. (UAB) during the period 2016-18. In 2018, I moved to Roma, joining the Palaeontology Research Group of UR3, for 30 months with a competitive contract. From 2021, I established my own research line of Vertebrate Palaeontology in small mammals at UDC (Spain), the only one focused on this topic in the University System of Galicia. I obtained 3 research projects for developing this line and I am co-leading 1 research project about Galician Oligocene fossil record. Besides, I am spearheading fieldwork excavations in Galicia.

I have pioneered the development of models for reconstructing the size of past small mammals, and the use of top-notch and cutting-edge palaeontological techniques for disentangling their biology and evolutionary history. I authored papers describing new taxa and reconstructing their past habitats. My studies have solved ancient discussion topics and have explained the eco-evolutionary dynamics of extinct taxa. I established the first long-term database of evolutionary responses of small mammals to insularity. I have an excellent scientific output (27 high-impact JCR papers, 1 under review, 3 in prep, 1 edited book, 2 book chapters, 46 congresses; 72% of leading role). I have been PI of 5 inter- and national projects, co-PI of 1 national project, and research team member of 4 national projects. I obtained 6 research competitive contracts and 3 teaching ones. I have >2.5 years of international mobility, being a member of 4 multidisciplinary research teams; and I have built an extensive international collaboration network. My postdoctoral publications are fruit of international collaborations. My career let me gain experience and essential qualities in leadership, management, independence, etc. and my training in new groups was based on the two-way transfer of knowledge. During my career, I established strong bridges with researchers from different fields, and led multi-authored studies from novel and original interdisciplinary views.

Besides, I am an active researcher in outreach to spread my results and disseminate science. In addition, I am the supervisor of 2 ongoing PhD students, 6 undergraduates and 1 MSc student, from both Spain and Italy, as well as volunteers and collaborator fellows. Their results have been published in high-impact JCR journals and were presented in international congresses. I have a broad university teaching experience, with >700h in BSc/MSc degrees, 2 innovative teaching projects, 4 accreditations, and appointed "cultrice della materia" in Palaeontology (UR3).

I co-formed and am co-leading the Vertebrate Palaeontology research line. Besides, I am Academic Editor of 2 renowned JCR journals, as well as refereed in specialized ones. I was a member of panels of inter- and national grants, and MSc dissertations. I was a member of Scientific and Organizing Committees, convenor of international meetings, and a member of science societies.

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**Turno General**

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| **Área Temática:** | Ciencias y tecnologías medioambientales |
| **Nombre:** | CABALLERO CASERO, NOELIA |
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| **Correo Electrónico:** | noelia.caballero.c@gmail.com |
| **Título:** | Análisis de contaminantes emergentes en fuentes de exposición humana y muestras biológicas |

**Resumen de la Memoria:**

My whole research career has been dedicated to the determination of organic compounds in various matrices. As a result, I have published 31 peer-reviewed journal articles, 2 book chapters, 2 international patents. Moreover, I am the Principal Investigator (PI) of four research projects, a co-applicant of an international project, and the PI of a dissemination project. Specifically, during my postdoctoral stage, I have focused on developing simple, efficient and greener analytical methods based on the use of supramolecular solvents to identify and determine organic contaminants to which humans are exposed. To achieve this goal, I have developed versatile sample treatments for the determination of organic contaminants or specific chemical groups, such as the analysis of bisphenols in environmental matrices, food, and biological fluids (Analytica Chimica Acta, 2021, 1144:14-25). However, understanding the chemical risk to which the population is subjected requires a more holistic view. Thus, in my most recent postdoctoral stage, I have focused on the analysis of organic contaminants using non-target approaches to identify emerging contaminants. I have carried out the determination and identification of emerging contaminants in environmental matrices (Chemosphere, 2021, 263:127817), food (Environmental International, 2022, 164:107281), and biological fluids (Chemosphere, 2021; 280: 130683).

The main goal of my future research line is to identify new sources of chemical exposure for humans to identify and determine new organic contaminants. It is well known that food significantly contributes to human exposure to environmental contaminants. Despite international legislative measures to control chemical occurrences in food for consumer protection, many uncontrolled sources, such as particulate matter deposition and biotic uptake from contaminated environments, can introduce unregulated contaminants into fresh and unprocessed foods. For this reason, I propose to investigate the presence of unregulated contaminants in fresh, unprocessed Spanish food ingredients, assessing their potential human exposure risk. This involves a novel, non-target approach combining supramolecular solvents with advanced analytical techniques like liquid chromatography (LC), bidimensional liquid chromatography (2DLC), high-resolution mass spectrometry (HRMS), and ion mobility spectrometry (IMS). The objectives include developing a universal platform for contaminant analysis in foods using SUPRAS with LC/2DLC and IMS-HRMS, identifying and semi-quantifying contaminants, and evaluating these foods as potential human exposure sources through a preliminary health risk assessment. This research is expected to create a green, cost-effective method for identifying and semi-quantifying food contaminants, reducing environmental impact and applicable across various regions and diets. It aims to fill the knowledge gap on food contamination from uncontrolled sources, supporting policy-making and mitigation efforts by organizations like EFSA. Societally, it upholds the Intangible Cultural Heritage of the Mediterranean diet in Spain, aligning with health trends and contributing to UN-SDG 2 for food security and sustainable agriculture. Economically, it promotes tourism by advocating for a cuisine free from unregulated contaminants, enhancing the Mediterranean lifestyle's appeal.

**Resumen del Currículum Vitae:**

In 2016, after a 12-week research stay at the RIKILT-Institute of Food Safety in The Netherlands, I defended my Doctoral Thesis, achieving the highest distinction and receiving the Cum Laude and International PhD mentions. My research focused on synthesizing novel supramolecular solvents (SUPRAS) and applying them for the determination of organic compounds and the valorization of agri-food residues. This research led to the publication of 8 scientific articles and my active participation in numerous national and international conferences, highlighting my contributions to the field. The significant interest generated by my publications on SUPRAS facilitated a fruitful collaboration with the University of Paris 13, resulting in an international patent for extracting astaxanthin from marine algae and two scientific articles. Additionally, my research yielded 4 scientific articles, one of which I was corresponding author, and the collaboration with a textile company to develop an environmentally friendly dyeing process using natural dyes. This initiative is currently in the patent application phase. In 2018, I joined the Toxicological Centre at Antwerp University, led by Prof. A. Covaci. My research focused on identifying and determining emerging environmental pollutants through high-resolution mass spectrometry and ion mobility techniques. I played an active role in the European HBM4EU project, leading to a scientific article that reports the first QA/QC set for harmonizing non-target approaches in human biomonitoring. Moreover, my collaboration with various international projects facilitated research stays at Seoul University (Republic of Korea) and RECETOX (Czech Republic). My research led to the publication of 8 scientific articles and the invitation to deliver a lecture at Hanyang University in South Korea. In 2020, I got a postdoctoral position at Salamanca University, where I continued to focus on environmental research, specifically on the development of bidimensional liquid chromatography platforms for pollutant determination. In 2021, I was granted a postdoctoral position at U. Córdoba by the Andalusian Government where my work focused on designing new SUPRAS for the analysis of environmental pollutants and the valorization of agri-food residues. I currently hold the prestigious Juan de la Cierva Incorporación and I am the Principal Investigator of four research projects: a UCOIMPULSA project on identifying emerging pollutants in edible fish; a Junta de Andalucía project for extracting bioactives from agri-food residues; and two UCO projects for developing bioSUPRAS for extractions and valorization processes. I am also co-applicant of an international project, and the PI of a dissemination project. In total, my research comprises 31 scientific articles, 2 book chapters, 2 international patents, and over 50 (inter)national conference contributions (2 invited talk), obtaining three awards. Regarding science dissemination I participate in podcasts and interviews, and. I am an editor of the GRASEQA Bulletin. Furthermore, in 2023, I supervised a PhD thesis (highest distinction), and I am currently supervising two ongoing theses (expected defense in 2024 and 2025). I have also supervised 10 Master's theses. In 2018, I got ANECA certification as Assistant Professor Doctor, Contracted Professor Doctor, and Private University Professor.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | LOZANO BERNAL, YUDI MIRLEY |
| **Referencia:** | RYC2023-045532-I |
| **Correo Electrónico:** | yudyja@gmail.com |
| **Título:** | Plant-soil interactions in a changing world |

**Resumen de la Memoria:**

The results of my research include 23 research papers, (14 of them as first author). All my publications are published in journals with percentile rank Q1 and 14 of them as D1 (of these 14 as D1, 12 were published as first author). I have been cited 1593 since 2019, and 1708 in total (Google Scholar). My h-index is 15 (based on Google Scholar, 31/01/2024).

My publications are mainly grouped into 3 research lines:
a)Soil biota modulating vegetation dynamics
b)Responses of root traits and soil fungal communities to drought
c)Microplastics effects on terrestrial systems

Under the supervision of Prof. Francisco I Pugnaire, Drs. Sara Hortal and Cristina Armas, I started collaborations with outstanding national and international experts in the field of plant-soil interactions, such as Prof. Carlos García (CEBAS-CSIC) and Prof. Wim Van der Putten (Netherlands Institute of Ecology) and Prof. Richard Bardgett (Manchester University).

Subsequently, I obtained a postdoctoral research position in the Rillig Lab (Freie Universitaet Berlin, Germany, 3 years). I participated in a project funded with more than 6.000.000 € (PI. Matthias Rillig, BIBS phase I) whose aim was to study rapid transitions in a changing world. I was the postdoc responsible for the work-package about above-belowground coupling (~800.000 €), which aimed to study the effects of rapid transitions (i.e., drought) on soil biota. In this phase, I lead a team involving another postdoc, 4 student helpers as well as several Master and Bachelor students. Then, we presented a proposal for phase II of the BIBS project, in which I co-wrote the work package aimed at understanding the effects of an emerging global change factor (microplastics), and their combined effect with drought on terrestrial systems. This work-package was funded with 210.000 € (Freie Universitaet Berlin, Germany, 2 years). After this, I obtained independent international funding from the German Cooperation Society (GIZ) in a project that aimed to transfer my knowledge acquired in Europe to research centers and Universities in Latin-America (15.000 €). Later, in 2022, I moved back to Germany as I was funded by the German Research Foundation (DFG) with 330.550 euros for a project that aims to disentangle the mechanisms by which microplastics affect plant-soil systems (PI. Yudi M. Lozano). Since 2019 I have been obtaining my own funding in order to advance in my research lines (A total of 556.250 € to date, Of this, 210.000 € after collaboration with other researchers (BIBS phase II)).

LINE OF RESEARCH TO BE DEVELOPED

I will study the effect of global change factors on vegetation dynamics, in particular, I will determine microplastic and drought effects on the mechanisms by which (i) nurse plants facilitate beneficiary species and their consequences on ecosystem multifunctionality and on the mechanisms by which (ii) plants enhance their competitive ability. Likewise, I will (iii) disentangle the mechanisms by which microplastics affect plant-plant interactions under different drought conditions, and (iv) determine microplastics and drought effects over time on plant-soil interactions and ecosystem functionality. Emphasis will be placed on assessing how soil biota and root morphological traits mediate these processes under current global change scenarios.

**Resumen del Currículum Vitae:**

My research focuses on understanding plant-soil interactions in a changing world.
First, as a predoctoral researcher (2010-2014) I have been interested in understanding the mechanisms underlying soil biota modulating vegetation dynamics. I was the first to disentangle the effects of soil properties, soil biota and microhabitat in the process of facilitation between plants, which is one of the most important processes that sustain drylands. Likewise, my research was the first in the field to evidence that in drylands, soil microbial communities undergo a secondary succession after disturbance, a process that may lag behind plant community succession. Such results evidenced the key role that soil microbial communities may have on the recovery of degraded areas, especially as soil biota may select early plant species to start plant community succession. Also, I showed that the enhanced competitive ability of species of invasive character is mediated by soil microbial communities which can lead to a complete dominance of such species in the plant community right after abandonment of agricultural fields.
Next, as postdoctoral researcher (2015-2021) I studied the effects of global change factors on plant-soil interactions. First, I focused on research about root traits responses to drought and their linkages with soil microbial communities. Again, the impact of my novel findings here had a major impact on the field because it helped to identify the potential species to use in areas subjected to drought conditions in order to keep ecosystem functionality under the current scenarios of global change. I found that such plant species with unique abilities to cope with drought acting in concert with soil microbiota, that could facilitate plant performance, can be an excellent strategy to promote equilibrium of different ecosystems worldwide. Also, my research proved that drought feedbacks on plant productivity and root traits via soil biota and that such effects occur even after the drought conditions have disappeared. Then, as a leading researcher in the field of microplastic effects on soils and plant communities, I was the first researcher showing that microplastics when added to soil can shift plant community composition, worryingly in a way that seemed to favor plant species with invasive character. I was also first to show that microplastics in soil can induce changes in ecosystem multifunctionality. Such effects strongly depends on drought conditions. Worryingly, I found that microplastics may cause negative effects on ecosystem multifunctionality of a similar magnitude as drought.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Currently,  as principal researcher (2022-ongoing) I am disentangling the mechanisms by which microplastics affect plant-soil systems, specifically how plastic particles and chemical additives may modulate the competitive ability of species of invasive character.

I have published 23 articles in high-impact journals of my field  (14 of them as first author). My research has been cited 1593 times since 2019. (8 articles have been obtained from my predoctoral stage, 11 from my postdoctoral stage and 2 articles more from my current stage as PI).

In addition, I have been guest lecturer of Ecology Courses at Freie Universtaet, Berlin, Germany and Artic University, Norway.I have also advised 18 bachelors, 1 master and co-advised 1 doctoral student.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

**Área Temática:** Ciencias y tecnologías medioambientales
**Nombre:** GÓMEZ DE LA PEÑA, LAURA
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**Título:** Imaging the Earth's crust and active tectonic structure using seismic data and innovative geophysical methods.

### Resumen de la Memoria:

I am a Marine Geosciences early career postdoc (PhD in June 2017). My primary research interest is the study of the Earth's lithosphere and its implications for the society (e.g. seismic and tsunami hazards, geo-energies). I work with geophysical methods to obtain information of the subsurface. I am specialized in the acquisition, processing and interpretation of active source seismic data (i.e. Multichannel Seismic -MCS- and Wide Angle Seismic -WAS- data), two complementary methodologies that are the cornerstone for crustal and upper mantle studies. In addition to my geological background, I developed strong geophysical technical skills, which provide me with a deep understanding of data limitations, fundamental to correctly interpret the results. My skills configure a unique geophysicist profile, as I have experience in tectonics, stratigraphy and basement interpretation (typically done by geologists) and in processing and modelling both, MCS and WAS data (often analyzed by different groups of geophysicists).

I expanded the knowledge acquired in my Bachelor in Geology (2011) improving my geophysical skills. During my PhD, I learnt advanced processing of MCS data and how to interpret the results in terms of basin evolution, crustal structure and active tectonics. The main results of my PhD redefined the geological framework of the westernmost Mediterranean, including the first crustal domains map of the area (Gómez de la Peña et al., 2018, Tectonics, Impact factor (IF)=4.061), the first coherent stratigraphy for the entire region (Gómez de la Peña et al., 2021, ESR, IF=10.509), and the first description and kinematic analysis of the plate boundary of the westernmost Mediterranean (Gómez de la Peña et al., 2022, Nat.Comms., IF=14.92). These results allowed a fundamental review of existing geodynamic models (Gómez de la Peña et al., 2021).

As a postdoc, I moved to GEOMAR (Germany), a world-leading institution in marine sciences. I was the PI of my two postdoc projects there, including a German-funded project (DEEP-Alboran) and a European Marie Curie Individual Fellowship (CAYMAN). I was trained in inverse tomographic methods and I learnt how to characterize the lithosphere using WAS data. I gained experience in seismic and tsunami hazard assessment, and I performed numerical tsunami simulations in collaboration with a leading group in this field (INGV, Italy). My results characterize of the seismogenic structure of the Alboran Basin (Gómez de la Peña et al., 2020, JGR, IF=3.956) and asses for the first time the seismic and tsunamigenic potential of the western Mediterranean plate boundary faults (Gómez de la Peña et al., 2021, Marine Geology, IF=3.37). I led the implementation of a novel code for 3D tomographic inversion, and obtained the first 3D crustal model of an ultra-slow spreading ridge (CAYMAN project, Gómez de la Peña et al., 2021, Conference paper DGG).

In April 2022, I began a Juan de la Cierva Incorporación fellowship at the ICM (Spain). I am applying my expertise in seismic data to test novel methodologies that allow to improve the resolution and accuracy of subsurface images on continental margins ("Generación de Conocimiento" project CONNECT, PIs: E. Jiménez and myself).

### Resumen del Currículum Vitae:

I have obtained my own research funds (>220.000€) in addition to my salary (>350.000€) for my entire career (MSc, PhD and postdoc). I have been PI of my 3 postdoc positions: a German-funded project through the competitive "Cluster of Excellence The Future Ocean" call, a EU Marie Curie Individual Fellowship and a Spanish-funded Juan de la Cierva Incorporación Fellowship. In addition, I am PI of an active "Generación de Conocimiento" project and a Severo Ochoa "Research Grant for Young Talents". I was awarded with 5 pre-doctoral personal grants.

I am author of 31 peer-reviewed publications, with 19 in the SCI Q1 journals including 2 D1 as first author: a review article in the 4th ranked journal in Earth Sciences (Earth-Science Reviews) and an article in a high-impact multidisciplinary journal (Nature Communications). Since my first publication in an SCI journal in 2015, my papers have received 289 citations from 201 different publications (Scopus, h-index=12). I am author of 53 international conference contributions and convener of 7 sessions in international congresses. I have published 5 open-access datasets.

I have participated in 10 marine geophysical cruises (298 ship days in total), increasing my experience and responsibilities to become Team Leader (data, instruments and 2-3 people) during 4 cruises.

Through project collaboration and stays at different institutions, I have established a network of international collaborators (e.g., IPGP, France; INGV, Italy; NAU, USA). The successful results of these collaborations are proven by publications in Q1 journals and convened sessions at international conferences.

I contribute to science dissemination activities since 2013. I have published my scientific results in national newspapers (e.g., La Vanguardia). I have teaching experience, and I have obtained the highest certification as University teacher from the ANECA agency (Profesor Ayudante Doctor, Profesor de Universidad Privada y Profesor Contratado Doctor). I have participated in students' supervision.

I am engaged in scientific management activities, as being the elected representative of the postdoc community (~250 postdocs) at GEOMAR (2019-2020) and organizing the group seminars of the Barcelona-CSI (~2 per month, 2022-2023). I contribute as a reviewer of different journals, and I have participated in the edition of a Special Volume at the Frontiers journal.

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| **Área Temática:** | **Ciencias y tecnologías medioambientales** |
| **Nombre:** | VILÀ CABRERA, ALBERT |
| **Referencia:** | RYC2023-045604-I |
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| **Título:** | Terrestrial vegetation dynamics in a changing world |

**Resumen de la Memoria:**

I am an ecologist studying the factors that regulate the dynamics of terrestrial vegetation in the Mediterranean, temperate and tropical biomes. My research lies at the intersection between ecology and biogeography, combining theoretical development with field studies, analysis of large datasets, and molecular approaches to improve the understanding of the most vulnerable plant communities and ecosystems to climate and land-use change. At present, I lead a research team focused on the study of the interactions between plants and soil dwelling organisms (fungi and invertebrate fauna). Understanding how these interactions maintain the biodiversity and functioning of terrestrial ecosystems is needed from a conservation and adaptive management perspective, as well as informing our knowledge of fundamental ecological processes.

My research on the field of terrestrial vegetation dynamics and functioning builds upon close international collaboration, spanning several scientific disciplines and areas of expertise. I will further the development of two main research lines (RL) to advance understanding in the response of plant communities and ecosystems to global environmental change across several biological scales and focusing on some of the most vulnerable biomes (Mediterranean, tropical and alpine regions), with the ultimate goal of informing on effective adaptive strategies to global change:

RL1. Diversity and function of soil organisms in forests at risk from global change. In particular, I will investigate (1) shifts in soil biodiversity in response to climate and land-use change, and (ii) the impacts of global change-driven soil biodiversity shifts on ecosystem functioning.

RL2. The role of mycorrhizas on the biodiversity and functioning of tropical montane forests, in particular, with the goal of resolving the role of mycorrhizal associations as regulating factor of tree biodiversity gradients and respective shifts in ecosystem-level processes.

This Ramón y Cajal grant will contribute to advance knowledge on the response of terrestrial vegetation to global change and inform on effective adaptive strategies.

**Resumen del Currículum Vitae:**

I completed my PhD thesis in Terrestrial Ecology at the Autonomous University of Barcelona and CREAF. I completed my first postdoc at CREAF (2015) and then moved to Scotland (UK) where I worked as Marie Sklodowska-Curie and Impact Fellow at University of Stirling (2016-2020). I have been Juan de la Cierva Fellow (2021-22) and currently I am National Geographic Fellow at CREAF. I am also postdoc at University of Alcalá and Honorary Lecturer at University of Stirling.

My work couples conceptual and empirical research to improve the understanding of the most vulnerable plant communities and ecosystems to climate and land-use change, and has produced novel hypothesis-driven frameworks to assess this vulnerability globally. I am continuously generating new hypotheses to study the most pressing global-change issues, such as the functional role of soil organisms in vulnerable plant ecosystems.

My papers accumulate > 700 citations since 2019, when I finished my first postdoc as independent Research Fellow, emphasising the increasing impact of my work. My publication records include journals such as Trends Plant Sci., Glob Chang Biol., or Ecol Lett. as first author, and PNAS in worldwide collaborations. My first author publications have a citation percentile median score of 86%, and thus are among the most cited works in their respective field (source: Web of Science). My data contributes to international networks (BeechGenomes, SoilTemp).

I have raised 570,000€ as PI from prestigious funding programmes (Marie Sklodowska-Curie, Univ. Stirling Impact, Juan de la Cierva, National Geographic Society, NERC). My most recently awarded project on the function of soil organisms at the Mediterranean – temperate ecotone has allowed me to establish my own research group with 1 PhD and 3 MSc students, and collaborators from 4 international and 3 national institutions. I also lead the research line on mycorrhizas-driven plant diversity and function in tropical montane forests within the international consortium between the National Pingtung Univ. of Science & Technology (Taiwan) and Univ. Stirling (UK).

I am co-supervising 2 PhD, 3 MSc and 1 BSc theses, and have previously mentored 3 PhD students and co-supervised 1 MSc and 4 BSc theses, including one awarded with the '2021 best project' distinction. The students I supervise come from diverse socio-economic contexts and countries (Chile, Finland, UK, Spain) and succeed at accomplishing their goals: 5 embarked on a PhD/postdoc, and others are environmental consultants. I hold teaching accreditations (ANECA, AQU, Univ. Stirling) and have taught > 200 hours at Univ. Stirling, UAB & UAH. I am deeply committed to educational and outreach activities.

**Resumen de la Memoria:**

My main line of research is the analysis of the impacts derived from climate change on the ocean and renewable energies. Thus, during my predoctoral stage I analyzed the impacts of climate change on different variables linked to physical oceanography, while my postdoctoral stage was focused on the study of climate impact on renewable energy, giving special importance to marine renewable energy.

I presented my thesis project entitled "Thermohaline variability in the Bay of Biscay: causes and physical implications" in 2016. I analyzed the variations in temperature and salinity in the last 30 years in the Bay of Biscay. During my postdoctoral stage I obtained a competitive grant from the Portuguese Government to carry out the project entitled "Impact of climate change on the offshore wind energy resource along the western Atlantic coast of the Iberian Peninsula" in the University of Aveiro, where I was for two years (05/2017-04/2019). Thus I began the analysis of the offshore wind resource and the impact of climate change on it through the analysis of future projections. Later I obtained a Juan de la Cierva Incorporation contract thanks to which I joined the University of Santiago de Compostela, specifically the Nonlinear Physics group (05/2019-09/2021). During this stage I continued my studies related to the analysis of renewable resources and climate change, as can be seen in different scientific articles of which I am the first author, and I also acquired new skills such as the management of the WRF (Weather and Research Forecast). I am currently part of the EPhysLab group of the University of Vigo thanks to a Juan de la Cierva Incorporation contract (02/2022-01/2025). During this phase I have strengthened my leadership by obtaining as IP a state project under the Ministry of Science and Innovation (SAFE Project: Survivability of floating wind turbines, €101,200). I have also obtained two contracts with CETMAR (Centro Tecnológico del MAR, 11,800€+17850€).

My future line of research will continue to focus on the analysis of the climate change process and its impact on the production of marine renewable energy, especially on marine renewable energy. However, it is important to note that I will implement new methodologies and also new studies, such as, the analysis of economic aspects through the calculation of parameters such as the Levelized Cost of Energy.

Recently, I worked on downscaling global climate models from the CMIP6 project, which provided the most recent high-resolution data for future climate projections. This work, incorporating two scenarios (SSP2-4.5 and SSP5-8.5) and a novel simulation method using the WRF atmospheric model, has been published. Moving forward, my research will leverage this high-resolution data to analyze specific aspects of offshore renewable energy in the Iberian Peninsula. It is crucial to note that the Spanish government has already designated marine areas suitable for offshore wind farm installations through Maritime Spatial Planning, encompassing 19 specific zones. The analysis will cover factors like turbine capacity, expected energy output, and optimal sizes, with a particular emphasis on addressing wake effects between turbines. Using the WRF model, I plan to conduct new simulations to optimize the distribution and orientation of offshore wind turbines, minimizing wake effects.

**Resumen del Currículum Vitae:**

I am a Postdoctoral Researcher at the University of Vigo. My main research line is to analyze the impact of climate change on different oceanic and atmospheric physical variables. More specifically, I have focused on the marine renewable energy assessment and the impact of climate change on them.

I presented my PhD thesis entitled "Thermohaline variability in the Bay of Biscay: causes and physical implications" at the University of Vigo on February 2016. My post-doctoral stage is marked by continued mobility since I obtained three competitive grants (accumulative funding: 185,739 €) in three different institutions: University of Aveiro (CESAM, 2 years), USC (2 years 5 months) and UVigo (3 years). In addition, I was hired for 4 months at the University of A Coruña (SEARENEW project).

I published 38 papers in JCR journals (11 as first author). It is relevant to mention that during the last 4 years, I published 6 research articles as first author all in Q1 journals, and 5 of them in the first decile of their category. Qualitatively, the relevance and contribution of these works to the generation of knowledge can be proved, for example, by the fact that one of these articles, which analyzed the impact of climate change on wind patterns, was cited in the last IPCC report.

I have participated as a researcher in 12 R&D projects. Currently, I am the IP of the SAFE project (Survivability of Floating Wind Turbines, TED2021-129479A-I00) granted by Ministerio de Ciencia e Innovación (funding: 101,200€). This project aims to analyze the response of floating structures to future extreme events of waves and wind. Moreover, I am the IP of two contracts (11.800€+17850€) with the Technological Center of the Sea (CETMAR).

I have participated in different dissemination activities to publicize my scientific activity. Thus, I am co-author of a dissemination book (ISBN: 978-84-8158-873-6) on renewable energy. I have been invited to 3 talks at scientific dissemination conferences. I have submitted 23 works to international conferences (10 oral communications given by me). In addition, I won the award for the best oral presentation at the "ISOBAY XV" International Conference held in Bilbao (06/2016).

Regarding internationalization, it is relevant the post-doctoral competitive grant of the Portuguese Govern and its associated project. Thus, I was hired by the University of Aveiro for two years (01/05/2017-30/04/2019). I worked at the Centre for Environmental and Marine Studies (CESAM) and I published several papers during these years.

In addition, I carried out collaborations in articles where I was the first author with researchers from the following institutions: GMAO-NASA (USA), IFREMER (France), CESAM (Portugal) and Xiamen University (China). I have participated as a researcher in two INTERREG projects funded by European Union. Additionally, I have collaborated in the organization of 2 international conferences.

I have supervised 5 Graduate Final Projects and 2 Master theses at Uvigo (Beatriz Arguilé and Brieuc Thomas). B. Arguilé finished her Master in 2021 and in the following course she obtained a grant for pre-doctoral contracts for the training of doctors (Spanish Ministry for Science and Innovation)

and she started her PhD under my supervision. B. Thomas has also started this course its PhD under my supervision. Therefore, I am currently supervising 2 PhD students.

**Resumen de la Memoria:**

Marine ecosystems are central to Earth' s carbon cycle, helping to mitigate climate change. My research career started investigating key questions regarding the biological carbon pump, a key carbon dioxide uptake oceanic mechanism which transports biologically fixed carbon dioxide from the surface waters to the deep ocean through gravitational sinking of marine particles. During my PhD I became proficient in the use of radionuclides as tracers of particle export in the open ocean, a technique that has certain advantages compared to sediment traps since it allows a much higher spatial and temporal resolution. At the beginning of my career I pointed out the importance of including small particles in marine biogeochemical modelling, compared satellite-derived carbon export estimates with in situ measurements over the entire NW basin of the Atlantic Ocean and assessed the need to develop regionally-adapted models to quantify the biogeochemical cycle of carbon, particularly in climatically relevant areas.

As a postdoc, I continued the same line of research and explored new venues beyond the study of carbon export. I started to collaborate with international researchers to estimate marine budgets of trace metals, evaluate methodological techniques to analyze radiotracers of interest for particle export and compiled the largest available dataset of a key parameter to quantify the export of carbon by means of the 234Th-method to support modelling efforts. It was also during that period that I had the opportunity to gain expertise in microbial ecology and I realized that I had to incorporate that aspect in my research if I was to significantly advance the currently knowledge regarding the processes affecting the efficiency of the carbon export to the deep sea. As a result, I started a second postdoc devoted to combine my experience in the study of the magnitude and strength of the BCP together with molecular ecology of marine microbes in other to characterize the impact of marine microbes in the attenuation of the carbon transfer to the deep ocean. This topic is in its infancy and has significant knowledge gaps, yet it is essential to constrain the global carbon budget and improve Earth system models.

Hence, I aim to develop a research line that will explore the role of marine microbes in carbon transfer between marine ecosystems. I am particularly interested in conducting my research in the continental margins, which have been considered one of the marine regional domains that require more attention in ocean carbon, yet their role as carbon sinks is poorly constrained. This approach allows me to bridge between different research fields and develop a new line in a relevant topic with ecological and socio-economic implications. Finally, my research line will also aim to incorporate the findings into biogeochemical modelling using global genomic and biogeochemical databases and benefiting from satellite and biogeochemical floats to contribute to reduce the current uncertainties regarding the efficiency of the biological carbon pump.

**Resumen del Currículum Vitae:**

My main research interests are related to the marine biogeochemical cycles, particularly to the carbon cycle and the transfer of organic carbon from the surface waters to the deep sea (i.e., biological carbon pump). The research conducted during my PhD showed that small particles are the main drivers of carbon export in oligotrophic areas, where export occurs at small but steady rates over the year. Several contemporary and later studies have corroborated the results, leading to a change of paradigm regarding the importance of these areas and types of particles in marine biogeochemical models. Other outputs highlighted the need of having regionally-adapted biogeochemical models and the importance of considering biological parameters at a regional level in satellite-derived export models to improve carbon cycle monitoring from satellite-based platforms.

During my first postdoc I enhanced my collaborations with international researchers, expanding my research beyond the study of carbon export. Several publications have emerged from this period, including a diverse range of research areas, such as the study of the particle scavenging produced by hydrothermal vents or a new mercury budget for the Arctic basin, among others. In parallel, I published the largest dataset of organic carbon to 234Th ratios to date. This is a key parameter to obtain carbon estimates when using 234Th as a particle tracer to estimate the magnitude of the biological carbon pump. Over the years I became aware of the crucial role that microbes play in marine biogeochemical cycles and how overlooked or oversimplified they are depicted in global marine biogeochemical models. In 2021 I joined ICM-CSIC, where I received training and guidance to incorporate necessary aspects of microbial ecology into my research, which is currently strongly directed to overcome some crucial knowledge gaps regarding the role that marine microbes play in the attenuation of organic carbon fluxes and therefore in the efficiency of the biological carbon pump.

I have authored 28 publications in indexed journals, most of them in the Q1. I have also participated in several international conferences, outreach activities and teaching for undergraduate students. My research and expertise using radionuclides as ocean tracers is being recognized by the international community. As a result, I have published a book chapter in Marine Analytical Chemistry, and I was invited to publish in the prestigious Annual Review in Marine Sciences. I am also the main guest editor for a special issue in collaboration with international researchers and I am an active reviewer for scientific journals, including ESSD, EPSL, GBC, GRL and L&O, among others. During my career I developed a multidisciplinary and dynamic research profile and a strong network of international collaborators. Indeed, all my publications have been done in collaboration with foreign researchers (>15 countries). I published my datasets in public repositories and aimed to publish in Open Access journals. I have participated in 15 research cruises, twices as Chief Scientist, spending >15 months at sea. As an early career researcher, I secured funds to conduct my research and I am currently supervising 2PhD students. In 2018, I co-organized the international SPERA conference and since Nov 2022 I am a member of SCOR Capacity Development Committee.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | MIRALLES CUEVAS, SARA |
| **Referencia:** | RYC2023-042474-I |
| **Correo Electrónico:** | sara.miralles.cuevas@gmail.com |
| **Título:** | Revolutionizing Water Treatment: Cutting-Edge UV-LED Photoreactor Design and Process Intensification |

**Resumen de la Memoria:**

Dr. Miralles is a Chemical Engineer from the University of Almería (UAL,2009), holding 2 Master's degrees, 1 in Solar Energy (2010) and 1 in Industrial Biotechnology (2011) UAL. In February 2011, she awarded an FPI scholarship from the Ministry of Science and Technology to conduct her doctoral thesis at CIEMAT-Solar Platform of Almería (PSA). During this time, she established a new research line focused on the treatment of nanofiltration rejection streams with advanced solar-based oxidation processes. She earned her Ph.D. from PSA-UAL in February 2015, receiving the Extraordinary Ph.D. award in the category of Experimental Sciences. In her first postdoctoral stage (2015-2018), she secured a position at SERC-Chile, conducted at the University of Tarapacá (UTA), Arica, Chile. Leading the implementation of the final phase of 3 technology transfer projects in extreme-areas, she focused on setting up two demonstrative membrane distillation and multi-effect distillation plants for arsenic removal from surface waters. Moreover, she initiated a new research line at UTA and secured her first national project as Principal Investigator/FONDECYT/11170122 (€120,000). In her 2nd postdoctoral stage (2018-2020), she obtained a Juan de la Cierva in Training contract (ranking 2nd in the Chemical Technology area), conducted at CIESOL-UAL in the Chemical Engineering department. During this contract, she initiated a new research line based on UV-LED technology. In June 2020, she secured an academic position at the Universidad Tecnológica Metropolitana (UTEM) in Santiago, Chile, where she led and established her research group "Sun, Science and Technology in Water Research - SST-WR" associated with the Solar Water Treatment and Biotechnology Laboratory. She also won a national project as PI (FONDECYT/Regular), ranked 1st in Chemical Engineer Area (€240,000), and formed a CYTED thematic network on Water Treatment, serving as the National Coordinator for Chile. This network includes 85-researchers from 11-Latin-American countries. Dr. Miralles ranked 1st in the Juan de la Cierva Incorporation (2019) in the area of Chemical Sciences and Technology. This contract was for one year (09/21-08/22), in Solar Water Treatment Unit at the Solar PSA-CIEMAT, during which she took leave from her position at UTEM. Since September 2022, she continues as a Professor at UTEM, achieving the highest rank of Full Professor on 12/2023. She is also a member of the Scientific and Technological Research Advisory Council of the Metropolitan Technological University (Sept2023, RESNº3411) and the Advisory Board of the new University Institute for Research and Technological Development (Dec.2023, RESNº300). Total teaching hours delivered since 2011: 709.8 hours in the main area of Chemical Engineering (+144 in 2024). Dr. Miralles is initiating new research lines, including the design and scaling of UV-LED photo-reactors for combination with solar and electrochemical photo-reactors, and another line focusing on the development of electrochemical sensors for detecting emerging contaminants in complex waters, being the lines that will continue to be promoted during this call. All research is based on regeneration of wastewater for irrigation, studying the simultaneous elimination of contaminants of emerging concern, inactivation of microorganisms and monitoring of antibiotic resistance genes.

**Resumen del Currículum Vitae:**

Briefly, she has an h-index of 27/28 (Scopus/Google Scholar 2024), counting 1879 citations (Scopus), >2400 citations (Google Scholar). The candidate has published 61 total scientific documents in international peer-reviewed journals (JRC); 55-papers (>87% Q1, 14 as first and 8 as corresponding author), 5-chapter books, and 1-national book. 29/55 of them in the first decile (D1, >52%). 5 articles have >100 citations, 1 of them has 294 citations. She has presented 76 works at conferences, including 19 oral communications, 3 of them as invited. Recipient of 3 Competitive Grants and 2 Awards (2 PhD, 3 Post-PhD). She has actively participated in 31 R&D projects, taking a significant role in preparing 16 of them over the past 4-5 years. Her roles have included serving as Principal Investigator, Co-Investigator, Director, and Associate Researcher, contributing to the successful acquisition of more than 1.5 million euros since 2020. Simultaneously with her research activities, she has been carrying out teaching activities at different levels (Degree, Master, and PhD studies). She has been a lecturer of the Degree in Chemical Engineering (UAL, Spain); Master of Solar Energy (CIESOL-UAL, Spain) and Doctorate in Materials Science and Process Engineering (UTEM, Chile). In total, she counts 709.8 hours (+144 assigned in 2024). She has supervised 3 MSc theses in collaboration with the University Federico II, Napoli, Italy (2012, 2019); 14 undergraduate theses (1 ongoing) and 1 PhD student in collaboration with PSA-Almería, Spain (1 ongoing UTEM as collaborator). Accredited by ANECA: Assistant Professor, Contracted Doctor Professor, and Private University Professor, 2019, Spain. Accredited by the Postgraduate School of the UTEM as a Postgrade Academic, 2020, Chile. Obtaining the i3 accreditation on January 10, 2023, with a score of 9.9/10. Distinguished reviewer in 2016/2017 for high-impact factor journals in the field (Chemical Engineering Journal, Applied Catalysis B: Environmental). Reviewer for both national and international projects and doctoral theses. Evaluator member for the State Research Agency (EAI, Spain), FONDECYT and FONDEF ANID reviewer - Chile and the FONCyT of Argentina. In terms of outreach, notable contributions include organizing 5 International Seminars on Solar Water Treatment (2015, 2016, 2018, 2021 and 2023), 3 Ibero-American Meetings on Water Sanitation and development of sustainable Technologies (2021, 2022 and 2023) and 1 Technological Fair (2016). In addition, participating as part of the Organizing Committee for 2 relevant International Congresses (SPEA10 and EEAOP3) and being a member of the Scientific Committee of CIPOA and events of the RED-AMARU CYTED. In addition, she is member of Chilean chemical society from 2017. The candidate won the "Juan de la Cierva en formación" 2016, Nº2 in the area of chemical technology and "Juan de la Cierva de Incorporación" 2019, Nº1 in the area of Chemical Science and Technology. Faculty member of the Diploma in Water and Solar Energy in Arid Zones at the University of Tarapacá since 2019 (RESNº0.60), member of the faculty of the Doctorate in Materials Science and Process Engineering since 2020 (RESNº89), and member of the faculty of the Master's in Chemistry with a focus on Materials Technology since 2022 (RES Nº01226). She leads the "Sun, Science and Technology in Water Research group"

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | REGULSKA , ELZBIETA |
| **Referencia:** | RYC2023-044109-I |
| **Correo Electrónico:** | regulska.elzbieta@gmail.com |
| **Título:** | Organic entities for brain cancer treatment |

**Resumen de la Memoria:**

I co-authored 31 articles (5 covers) published in JCR peer-reviewed journals and 2 book chapters (Wiley, RSC) (Citations: 571, H-index=16). I am the corresponding author of 13 and the 1st author of 21 papers. I participated in 15 international and 16 national conferences. I gave 4 invited talks in Poland (3) and Mexico (1). In 2023, I got accreditation from ANECA as a prof. contratado & prof. ayudante doctor. In 2023, I received a Habilitation Degree from the University of Bialystok (UwB, Poland), solidifying my contributions to the field of organic chemistry. In 2023, the Polish Academy of Science awarded me for my scientific successes. In 2022, I obtained the i3 certification. In 2023, I got accreditation from ANECA as a prof. contratado & prof. ayudante doctor. In 2023, I received Habilitation Degree from UwB. I received 11 awards: Polish Academy of Science award (2023); 3 Seal of Excellence distinctions for MarieCurie (EU) proposals (2019-21); 3 Rector of UwB awards (2011, 2016, 2017); two awards for the best talk (2022, 2010); award for the best poster (2011); and Governor of Podlasie Voivevodship distinction (2014). Altogether, I worked abroad for 6 years and 6 months (5 years and 8 months as a postdoc and 10 months in two predoctoral stages abroad in Germany, 3 months, and USA, 7 months); in particular, I worked at: 1) the Uni. of Erlangen (UE, Germany) in Prof. Guldi' s group (3 months); 2) the Uni. of Heidelberg (UH, Germany) in Prof. Romero-Nieto' s group (1 year & 11 months); 3) the Uni. of Texas at El Paso (UTEP, USA) in Prof. L. Echegoyen' s group (1 year & 1 month); and 4) the Uni. of Castilla-La Mancha (UCLM, Spain) in Prof. Romero' s group (3 years & 3 months). I organized 5 international conferences in: Germany (1), Basque Country (1) and Poland (3). I am a Vice-president of the Spanish Society of Phosphorus Chemistry, and a member of the European Chemical Society and Polish Chemical Society (since 2010). Since 2020, I belong to the Polonium Network, a community uniting Polish scientists conducting research abroad. I got 5 independent projects as a PI (3 Polish & 2 Spanish), 4 of them evaluated nationally. I was researcher in 12 more grants (5 in Spain, 4 in Germany, 2 in USA, 1 in Poland). I have leadership skills and experience in training people: I am a co-supervisor of 2 PhD theses (UCLM). I supervised 10 MSc (UwB), 5 BSc (UwB, UH), and 3 intern theses (UH). At UwB, I taught 1893 h during 9 academic years (2010-2021). I am a reviewer for 16 journals. I was a Guest Editor of a special issue in Catalysts. I was a member of the Institute' s Advisory Committee for Research Projects Submitted for External Programs & Institutions Financing Science (2015-2018). With this grant, my goal is to integrate all the expertise I have acquired throughout my career, and thus to develop a new nasal drug administration technology for brain cancer treatment by the encapsulation of brain tumor chemotherapeutics into polymeric nanoparticles (NPs). I have been working in the development of cancer drugs and the synthesis of NPs. Now, I aim to continue the evolution of my research towards the use of polymeric NPs for brain cancer treatment. I believe that my logical new research line will make a major breakthrough in the administration of brain cancer treatments.

**Resumen del Currículum Vitae:**

I studied Chemistry (Bachelor+Master Degrees) at the University of Bialystok (UwB, Poland). In 2010, I got Master Degree with Summa Cum Laude (thesis: SPR-biosensor for cancer markers). In 2015, I received PhD degree with Summa Cum Laude from UwB (Synthesis of fullerene-modified TiO2 photocatalysts). The same year (2015), I got a position at UwB as research-teaching assistant. To deepen into photophysics and organic synthesis, during my PhD, I did 2 stays abroad: 1) 3 months at Uni. of Erlangen (Germany) with Prof. Guldi, 2) 7 months at Uni. of Texas at El Paso (UTEP, USA) with Prof. L. Echegoyen. I completed my PhD with Summa Cum Laude in 2015. I received 2 independent national grants from the Polish National Science Center as PI. I did postdoc stays, in total 5 years and 8 months, in USA (6 months), Germany (1 year & 11 months) and in Spain (3 year & 3 months). To reinforce my expertise in organic synthesis, I made a postdoc at UTEP (USA). I focused on dyes, solar cells, and electropolymerization. After, I was attracted by the potential of P-heterocycles (PHs) for materials science. Thus, in 2017, I made another 6-month postdoc with Prof. Romero-Nieto at the Uni. Heidelberg (UH) in Germany. There, I conceived new PHs and applied them in OLEDs. In 2017, I got my 3rd independent Polish grant as a PI and returned to UwB. I developed multifunctional inorganic nanoparticles and exploited their supercapacitive, magnetic, photo- and electrocatalytic potential. Pursuing novel applications, I embarked on a sabbatical leave, rejoining Prof. Romero' s group, first in Heidelberg and since 2020 in Albacete. Here, I conceived novel PHs for cancer treatment. Also, I synthesized novel colorimetric sensor for pancreatic enzymes; the results were submitted for German patent. In March 2021, I returned to UwB and was promoted to associate prof. In Nov. 2021, I received a Maria Zambrano grant as a PI (with the highest mark). Thus, in 2022, I returned to Spain. In 2022, I obtained the i3 certification. In 2023, I got accreditation from ANECA as a prof. contratado & prof. ayudante doctor. In 2023, I received Habilitation Degree from UwB. I received 11 awards. In 2023, Polish Academy of Science awarded me for my scientific successes. My 3 MarieCurie (EU) proposals (2019-21) were distinguished with the Seal of Excellence. In 2011, 2016 and 2017, I received 3 awards from the Rector of UwB. I obtained two 1st awards for the best talk, and 1st award for the best poster. I received Governor of Podlasie Voivevodship distinction. I co-authored 31 papers (5 covers), 2 book chapters. I participated in 15 international and 16 national conferences. I gave 4 invited talks in Poland (3) and Mexico (1). I was PI of 5 projects and participated in 12 (2 x USA, 4 x Germany, 5 x Spain, 1 x Poland). I had a collaboration with the private sector (Polish company). I have leadership skills and experience in training people: I am a co-supervisor of 2 PhD theses (UCLM). I supervised 10 MSc (UwB), 5 BSc (UwB, UH), and 3 intern theses (UH). I have broad teaching experience from UwB (1893 h). I am reviewer for 16 journals. I was editor of a special issue in Catalysts. I organized science dissemination events. I was active in organizational duties. I am a Board Member of the Spanish Society of Phosphorus Chemistry.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | MUÑOZ SANTIBURCIO, DANIEL |
| **Referencia:** | RYC2023-045757-I |
| **Correo Electrónico:** | danielmunozsan@gmail.com |
| **Título:** | ab initio simulation of chemical and physical processes |

**Resumen de la Memoria:**

My research so far has mainly consisted in the study via ab initio Molecular Dynamics methods and enhanced sampling techniques of different processes taking place in water and water/mineral interfaces at different conditions and environments. These include the diffusion process of H+ and OH- in bulk and nanoconfined water, chemical reactions like prebiotic peptide synthesis and water self-dissociation in nanoconfinement, heterogeneous catalysis at $Au/TiO_2$ nanoparticles in the aqueous phase, and finally radiation chemistry in water ice at space conditions and in water/DNA systems. In all these cases I have been able to describe the physics and chemistry of these systems down to the electronic structure level, elucidating several details such as reaction mechanisms, charge states of the involved species, and energetics of the process. In addition to this main line, I have carried out further research using ab initio methods to study different physico-chemical phenomena in several other condensed phase systems, from phyllosilicate minerals to semiconductors in solar cell components.

In the last years, I have made a strong effort to define new methodological approaches applying the 2nd-generation Car–Parrinello MD method to different situations. Thanks to this effort, I am now obtaining exciting results that support two promising research lines.

The first of these lines consists in the simulation of ionic diffusion and reactivity in water with 2nd-gen. Car-Parrinello MD. In this line, in addition of havind produced already a paper where I am single author, I have current remarkable ongoing results regarding the self-dissociation of water and the diffusion of the excess proton and hydroxide in light and heavy water. These have been produced with unprecedented accuracy, showing that my approach can produce statistics that are superior to the most recent methods based in Machine Learning.

The second line consists in the multiscale simulation of radiation damage processes employing Ehrenfest MD and 2nd-gen. Car-Parrinello MD. Here, I also have preliminary results demonstrating that the 2nd-gen. CP MD method produces the correct dynamics of the ionized water dimer, which is non-adiabatic and thus challenging to capture computationally. This extremely efficient methodology will be applied to different problems, from the formation of $H_2O_2$ in proton-irradiated water to the radiation damage in solvated DNA.

**Resumen del Currículum Vitae:**

Dr. Daniel Muñoz-Santiburcio (DMS) started his career in 2007, in the PhD program in Theoretical and Computational Chemistry (U. of Granada), obtaining the PhD title (cum laude) on 19/7/2012. During the PhD, under the supervision of Dr. Alfonso Hernández-Laguna at the Spanish Research Council, he spent 3 months as guest student in the group of Prof. Michele Parrinello (ETH Zürich/USI Lugano), one of the pioneers in the field of Molecular Dynamics (MD), training on methods like ab initio (Born-Oppenheimer) MD and Metadynamics.

In September 2012, DMS joined as a postdoc researcher the group of Prof. Dominik Marx at Ruhr-Universität Bochum (Germany), one of the world-reference groups in the field of ab initio simulations, with a project on ab initio (Car-Parrinello) MD and Metadynamics simulations of prebiotic peptide synthesis in nanoconfined water at extreme conditions. During this stage he produced several high impact publictions such as 2 Nat. Commun., Chem. Sci., Phys. Rev. Lett. and Angew. Chemie Int. Ed. (all as 1st and corresponding author). Here, he also trained student Niklas Siemer on ab initio MD and free energy methods.

In 2017, DMS was awarded a Marie-Sklodowska Curie Individual Fellowship [H2020-MSCA-IF-2016, g.a. 748673, "PROIRICE"], joining in October 2017 the nanoscience research center CIC nanoGUNE (San Sebastián, Spain) under the supervision of Prof. Emilio Artacho (CIC nanoGUNE/University of Cambridge). In this project he performed state-of-the-art Real-Time Time-Dependent-DFT simulations to study the effect of proton irradiation on water ice.

In October 2019 to August 2021, DMS joined the ESC2RAD collaborative project (H2020-COMPET-2017, g.a. 776410) as a postdoctoral researcher on the nanoGUNE node. Within this project, he has worked on the effects of proton irradiation on water and water/DNA systems as well as in semiconductor components of solar cell materials.

In September 2021, DMS started working as postdoctoral researcher at the Instituto de Fusión Nuclear "Guillermo Velarde" of the Univ. Politécnica de Madrid (Spain), with Prof. Jorge Kohanoff in a project funded by the Beatriz Galindo program and devoted to the study of the effects of ion irradiation on systems of biological relevance.

During the last years, DMS has also started an independent research line devoted to the study of diffusion of H+ and OH- ions in water at different conditions, having already produced one publication as single author in J. Chem. Phys.

DMS has published 26 papers and a preprint, of which 13 as first and/or corresponding author.

DMS possesses extensive communication experience, with 17 oral presentations at international conferences (3 of them invited). He has also experience in management duties, having formed part of the Early Career Researchers' board of the Cluster of Excellence RESOLV (EXC 1069, German Research Foundation) and as substitute member in the Management Committee of the COST action "Chemobrionics".

In addition, DMS is very experienced in obtaining and managing High-Performance Computing resources. He has obtained funding in terms of computer time for the biggest HPC facilities in Europe summing up more than 310 million of core-hours.

Finally, in the last year DMS has obtained the i3 certificate.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | GARCÍA FERNÁNDEZ, ANA MARÍA |
| **Referencia:** | RYC2023-042600-I |
| **Correo Electrónico:** | AnaM.Garcia@uclm.es |
| **Título:** | Supramolecular functional materials made of peptides and p-conjugated molecules |

**Resumen de la Memoria:**

During her PhD, Dr. Ana M. García developed novel, potential drugs for the treatment of central nervous system diseases. She focused on the development of medicinal chemistry programs, from the design to the synthesis and the characterization of different heterocyclic molecules to study their biological activity and their druggability properties. Over her 1st postdoc, she moved to the field of ultrashort peptides to prepare supramolecular assemblies as functional materials for biotechnology or therapy, connecting this way with her PhD. In this context, she used chirality as an innovative tool to achieve gelation and nanostructured materials. She is mastered in the multi-scale characterization of these self-assembling peptides, from the single molecules to the macroscopic scale using a number of spectroscopic, calorimetric and microscopic techniques. Over her 2nd postdoc, she extended her knowledge in supramolecular chemistry by studying longer polypeptides with biological relevance and applying her experience in chirality to investigate their supramolecular arrangement into amyloids. During her 3rd postdoctoral period, she combined the experience in organic synthesis from her PhD with her know-how in supramolecular chemistry to explore chiral, H-bonded p-conjugated molecules with applications in the field of organic (bio)electronics. After her 4-year PhD and her 6 years of postdoctoral experience abroad, in 2022 she was awarded with the prestigious talent recruitment program María Zambrano to start her own research line at the University of Castilla-La Mancha in Spain. Her proposal focuses on exploring the self-assembly in short peptides by means of microfluidic technologies to create optical waveguiding hydrogels to be exploited in light-based small-volume NMR spectroscopy to enhance NMR signal. Moreover, from 2022 she is PI of a project funded by Junta Comunidades Castilla-La Mancha (JCCM)-FEDER, aiming to prepare supramolecular peptide-based assemblies for the development of optical waveguides as key components of biophotonic chips, combining both short peptides and functional, p-conjugated units.

Peptide assemblies stand up for their ease of preparation and the sidechains normally present on the 20 natural amino acids, as well as the various synthetic alternatives present on commercially available analogues and non-canonical amino acids, overall provide a rich "toolbox" in supramolecular chemistry, to master peptide organization at the molecular level, which expands to the macroscale to form nanostructured, yet macroscopic materials with controlled functionality. The use of microfluidics allows fine control of self-assembly, leading to diverse structures in comparison to classical conditions. The emerging optical properties of peptide-based assemblies open new avenues to create smart materials, extending their applications in the future towards sensing and biocatalysis, among others.

**Resumen del Currículum Vitae:**

Dr. Ana M. García obtained her BSc in Chemistry at the University of Castilla-La Mancha (UCLM) in 2011, with First Class Honors (9.3/10). Then, she was awarded with a 4-years JAE-Predoc fellowship from CSIC, to do her PhD at the Medicinal Chemistry Institute in the group of Prof. Martínez. She received her PhD by the Complutense University in 2015 (Cum Laude Mention). During her PhD, she did two short stays: one at the University of Barcelona in 2013, and another one at the Karlsruhe Institute for Technology (KIT, Germany) in 2014. The latter was funded by a grant she obtained from the German Academic Exchange Service (DAAD). During her PhD, she got 8 publications (2 in D1, 3 in Q1, 6 as first author) and 1 licensed patent.

In 2016, she joined the group of Prof. Marchesan at the University of Trieste (Italy), and she was awarded with a postdoctoral fellowship from Ramón Areces Foundation (2016-2018, 2 years). She studied supramolecular self-assembly of short peptides as (bio)materials. She published 12 research articles (4 in D1 and 5 in Q1), and 4 presentations at international conferences (3 as oral communications).

In 2019, she moved to the group of Dr. Torbeev at the Supramolecular Science and Engineering Institute (ISIS, University of Strasbourg) to study the supramolecular self-assembly of intrinsically disordered polypeptides in the frame of an ERC starting grant, and she published 2 research articles in Q1 journals (1 as first author).

In 2020, she joined the group of Dr. Ruiz-Carretero at the Charles Sadron Institute at the University of Strasbourg, to explore the supramolecular self-assembly of chiral, H-bonded p-conjugated molecules. She got 3 publications (2 as first author in Q1 journals).

In 2022, she was awarded with the prestigious grant María Zambrano for the recruitment of talented researchers to join the UCLM, where she has set her own research line. In 2022, she was awarded with a project as Principal Investigator from JCCM-FEDER. In this position, she has published 1 research article in Q1 and 1 review as corresponding author.

She is coauthor of 28 high quality, peer-reviewed publications (11 as first author), 19 published in D1 (6) and Q1 (13). She is coauthor of 1 licensed patent application. She has been selected for 7 oral communications at international conferences (1 as invited speaker) and 7 posters, and she gave 3 invited seminars at top-level institutions: Karlsruhe Institute for Technology (Germany), University Jaume I and IMDEA Nanoscience. She has been awarded with 5 research fellowships at different stages of her career and 5 grants to participate in conferences or courses. She has worked in 9 national/international research projects, 2 of them as PI. To date, she counts with 567 citations and h-index of 12 (Web of Science). Over her research career abroad, she supervised 3 undergraduate (1 Erasmus student), 2 master and 1 PhD students. From 2022, she has co-directed 3 TFG and 2 TFMs (one from an international students funded by the Erasmus program), and she is currently codirecting 1 TFG, 1 TFM and 1 doctoral thesis. She has participated in several outreach activities over her career ("Semana de la Ciencia", "Fete de la Science", "IUPAC Global Women Breakfast", "11F: The International Day of Women and Girls in Science"), showing her commitment as scientist to bring science to the society.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | ALCARAZ , MIRTA |
| **Referencia:** | RYC2023-043324-I |
| **Correo Electrónico:** | alcarazmirtaraquel@gmail.com |
| **Título:** | Desarrollo e implementación de estrategias analíticas/quimimétricas para la resolución de problemas de carácter biológico, ambiental y alimentario |

**Resumen de la Memoria:**

I am a member of the Scientific Research Career in the assistant category of the National Council of Scientific and Technical Research (CONICET) and a professor of Analytical Chemistry and Mathematics at UNL. Currently, I am an active member of the Laboratory of Analytical Development and Chemometrics (LADAQ) of the same faculty.

My scientific career training is focused on chemometric analysis applied to solve problems of chemical and biological interest, with solid experience in using separative and spectroscopic analytical techniques. In 2016, I received my PhD in chemistry from the Faculty of Chemical Engineering, UNL. Between 2014 and 2016, I completed a training stay at the Vienna University of Technology under the direction of Prof. Dr Bernhard Lendl, where she was trained in new infrared spectroscopy technologies for protein analysis, implementing my knowledge in chemometrics for problem-solving.

From April 2017 to October 2019, I completed a postdoctoral stay at the INQUIMAE-UBA-CONICET, Argentina. I was trained in constructing instrumental platforms for detecting multi-dimensional signals in dynamic systems. I built a simple, inexpensive, fast-recording spectrographic device to acquire fluorescence EEM in flow systems coupled with chemometric data resolution.

In November 2019, I was incorporated into the permanent staff of the CONICET as an assistant researcher. In 2023, I was promoted to the adjunct research category, which I possess up to the present.

In my career, I have collaborations with national and international groups linked to developing chemometric methods for resolving multidimensional data in various applications. I collaborated with other researchers and members of LADAQ, showing a solid relationship in the research group. Through collaborations with a group from the National University of Rosario, chemometric algorithms were developed for the processing of third-order multidimensional data for quantitative purposes, a graphical interface was developed for pre-processing fluorescence data, and contributions were made to the study of rotational ambiguity in the resolution of second order data. In collaboration with a research group of the University of Extremadura, under the direction of Prof. Dr Arsenio Muñoz de la Peña, works related to third-order multivariate calibration based on EEM detection were published. In collaboration with the working group of the University of Extremadura, a work was published for the

With over 40 scientific papers published in high-impact journals, most of them quartile 1 according to the Scimago index, including 4 book chapters, I present an h-index of 14. I have been the corresponding author in 8 publications, one selected as the front cover of the prestigious journal of analytical chemistry, Analytica Chimica Acta. According to Scopus, 39.4 % of the documents are co-authored with researchers in other countries/regions. Moreover, 3.0 % of the papers were authored with both academic and corporate affiliations.

**Resumen del Currículum Vitae:**

Dr. Alcaraz is an experienced and self-motivated teacher and researcher with extensive experience in chemometrics and analytical chemistry, mainly applied to environmental and food analysis. She is Head of Practical Works in Analytical Chemistry, Associate Professor of Mathematics at the Universidad Nacional del Litoral, and Adjunct Researcher at the National Council for Scientific and Technical Research (CONICET) of Argentina.

Her interests include the development of analytical methodologies coupled with the chemometric resolution of data for the analysis of evolutionary and dynamical systems in biological and environmental samples.

She received her PhD in Chemistry in 2016, focusing on developing and validating new analytical methods in combination with chemometrics to determine different compounds present in samples of complex composition, such as drugs in biological and simple environmental materials. She has vast experience in various analytical techniques, such as liquid chromatography, fluorescence, absorbance, infrared spectroscopy, and electrochemistry, and developing new analytical instrumentation.

During her PhD, she spent 15 months at the Institute for Chemical Technologies and Analysis at the Technical University of Vienna, where she developed a system based on mid-infrared lasers using new external cavity quantum cascade lasers (EC-QCL) for the analysis of proteins in aqueous solution.

During her postdoctoral stay at the University of Buenos Aires, she worked on multidimensional signal acquisition devices for flow and kinetic applications, which needed special chemometric modelling.

She has over 10 years of experience teaching undergraduate and graduate courses.

She maintains collaborations with numerous national and international groups.

In 2022, she did a 2-month postdoc stay at the Department of Analytical Chemistry, Faculty of Sciences, UEx. She was awarded a María Zambrano grant from the Spanish Ministry of Universities to research and teach. This stay will finish on May 31, 2024.

She has been principal investigator of 4 research projects and has participated in the collaborating group of more than 15 research projects.

Her experience is reflected in more than 37 scientific articles published in the most prestigious international journals, most of them in the Q1 quartile according to the Scimago index, and she is the author of several book chapters. Currently, she has an h-index of 14. She has been the corresponding author of 8 publications, one of them selected as the journal front cover in one of the most prestigious journals in analytical chemistry (Analytica Chimica Acta).

She has participated in numerous national and international congresses and conferences related to analytical chemistry and chemometrics. She has given seminars and lectures at national and international conferences. She has received a prize for the best thesis in Biotechnology awarded by the Province of Santa Fe, Argentina and the FBCB-UNL. She received the "Best Poster Wiley-ICAVS8" award at the 8th International Conference on Advanced Vibrational Spectroscopy, Vienna, 2015.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | SAEZ CASTAÑO, JANIRE |
| **Referencia:** | RYC2023-045288-I |
| **Correo Electrónico:** | janiresaez@hotmail.com |
| **Título:** | Biomaterials and microtechnologies for cancer research. |

**Resumen de la Memoria:**

My research line focuses on understanding complex biological processes inherent in cancer, combining chemical and technological approaches. Specifically, I develop biomimetic platforms that aim to emulate human organs, facilitating real-time multi-parametric monitoring of complex biological phenomena. Through these systems, my aim is to decipher the metastatic progression of cancer cells as they migrate from primary tumour sites to distant locations. These platforms combine: 1) Biomaterials made of biopolymers (collagen) and conducting polymers (PEDOT:PSS), tailored to mimic specific tissues. 2) Microtechnologies including microfluidics and bioelectronic sensors. The microfluidic technology is designed to emulate human organs, also known as "Organ-on-a-Chip" systems. Bioelectronics allow the electrochemical monitoring of cell growth through an ionic-electronic mixed conduction. These platforms offer significant advantages as alternatives to traditional animal models in cancer research, drug discovery, and healthcare. 3) Cell culture is hosted within biomaterials and interfaced with microtechnologies to replicate human physiological conditions occurring in cancer.

The trajectory of my research originates from the evolution of my scientific interests, which began during my doctoral studies at the University of the Basque Country. There, I pioneered the development of functional materials, chemo-responsive (Saez et al. Sens and Actuators B 2016), thermo-responsive (Tudor and Saez et al. Sens. Actuators B 2016), light responsive (J. Saez et al. Sens. Actuators B 2017, and ter Schiphorst and Saez et al. Lab Chip 2018) polymers integrated into microfluidic systems, aimed at controlling fluids and monitoring pollutants in environmental samples. These systems played a pivotal role in reducing reagent consumption, sample volumes, and analysis times.

Subsequently, during my postdoctoral tenure as a Marie Curie Fellow at University of Cambridge, I explored the burgeoning field of bioelectronics. Here, I acquired knowledge of electronics and biology, and started to develop cell culture models interfaced with electroactive materials to engineer biomimetic sensors for cellular monitoring. Leading multidisciplinary projects, I collaborated with researchers from diverse backgrounds to develop groundbreaking innovations. In one project, we synthesized functional materials with electroactive and thermo-responsive properties, facilitating the capture and release of cancer cells while enabling real-time electrical monitoring (Garcia-Hernando and Saez et al. Biosens. Bioelectron. 2021). In another project, we designed 3D electroactive scaffolds mimicking the human extracellular matrix, supporting cell differentiation and enabling the monitoring of cell growth and viability (Saez et al. Mater. Today Chem. 2022; Barberio and Saez et al. Adv. Healthcare Technol. 2022; Savva and Saez et al. Mater. Horizons 2023, Pitsalidis, Pappa and Saez et al. Chem. Revs. 2021, Barron, Oldroyd and Saez et al. Adv. Materials 2023).

Since 2021, I am an Ikerbasque Research Fellow and Leader of the Bioelectronics and Microfluidics research line at the University of the Basque Country. Here, we explore the integration of bioelectronics sensors into microfluidic devices, with the goal of developing advanced microtechnologies for cancer research.

**Resumen del Currículum Vitae:**

Ikerbasque Research Fellow since 2021, Leader of the Bioelectronics and Microfluidics research line at the University of the Basque Country (UPV/EHU) and member of the Microfluidics and Biomics Cluster UPV/EHU. My research team focuses on developing human Organ-on-Chip systems, where innovative microtechnologies are applied to respond specific questions related to cancer research. Since my incorporation into the UPV/EHU, I have obtained several competitive projects as PI (Fundación Vital (2023), Proyectos Estratégicos en Salud (RIS3) from the Basque Government (2022, 2023), GOVA from the Basque Government (2022), ANR France (2022), MINECO (2021). These last years, I have established collaborations with Dr. Amaia Cipitria and Dr. Maria Caffarel from Bioguipuzkoa (Health Institute), Dr. Asís Palazón from CIC BioGUNE (Research Center) and, Dr. Lorea Valcárcel from the Biochemistry department at UPV/EHU, and companies like Polykey Polymers (Donostia-San Sebastian). I have an extensive international collaboration network in Delft University (Prof. Achilleas Savva), INSERM France (Dr. Donata Iandolo), coordinators of two European Consortiums I am involved with. I am an outreach advocate and I participate yearly in Conocelas (ASEICA), Zientzia Astea and Emakumeak Zientzian (UPV/EHU), and European Researcher`s Night initiatives to inspire students to choose a STEM career path, especially girls.

Indicators: h index:10. 25 publications (Q1), 6 as CA and 10 as first author. 2 books. 3 invited book chapters. 2 patents. 19 Oral presentations (3 Invited Talks), 22 Poster Contributions.

Bachelor¿s degree in Chemistry in 2012 and Master's degree in Pharmacology in 2013 from the University of the Basque Country (UPV/EHU). In 2014 I started my Ph.D. in Microfluidics titled "Integration of functional materials into microfluidic devices for fluidic control and sensing" at the CIC microGUNE (Arrasate-Mondragon), continuing in the University of the Basque Country (UPV/EHU) where I received my Ph.D. in 2017. During this period, I undertook international research stays with Prof. Chumbimundi-Torres (University of Central Florida, 4 months), and Prof. Dermot Diamond¿s lab (Dublin City University, 1 month) where I had the opportunity to interact with people from other backgrounds such as biologists, materials engineers and resulting in 12 successful publications in high impact journals (Q1) and 26 communications at competitive international conferences. In addition to this, I participated in several national (Elkartek) and European projects (FP7: NAPES).

In 2019, I started my Marie Curie Individual Fellowship where I developed organ-on-chip models to understand the role of the interstitium in cancer metastasis. I obtained funding from several national and European agencies (H2020) such as Marie Curie (2019), Basque Government Postdoctoral Fellowship (2019), and collaborated in writing proposals for European Consortiums such as RISE, ITN (H2020). I was supervisor of 4 Master students and daily supervisor of 2 PhD students. These research years led to the collaboration with high profile scientists as Prof. Roisin Owens and Prof. Ruth

Cameron from Cambridge University and, Prof. David Mecerreyes from Polymat (UPV/EHU), that lead to the publication of 11 articles and 1 book chapter in prestigious journals (Q1) and 9 communications at international conferences.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | PALO NIETO, JUAN CARLOS |
| **Referencia:** | RYC2023-042493-I |
| **Correo Electrónico:** | carlos.nieto@angstrom.uu.se |
| **Título:** | Developing new chemical approaches for the synthesis and characterization of small and more complex molecular structures with potential biological activity |

**Resumen de la Memoria:**

I have a long-standing interest in the synthesis of new molecules and materials that can possess a valuable biological activity. Related to this, I have been working in different fields such as carbohydrates chemistry, catalysis, medicinal chemistry and materials chemistry. The expertise in these topics have been acquired by working in prestigious international institutions such as Stockholm University, University of Bristol and Uppsala University.

In the field of carbohydrates chemistry, through my PhD I was working using carbohydrates as chiral building blocks for the development of pharmaceutical compounds and the synthesis of small molecules with biological properties. In 2015, I was awarded by the Royal Society with Newton International Postdoctoral Fellowship to join University of Bristol. During this period, I developed several catalytic chemical approaches for the synthesis of oligosaccharides and glyco-conjugates of biological importance. On the other hand, during my Postdoc training and PhD student exchange at Stockholm and Mid Sweden University, I was working on catalysis chemistry, using a combination of metal and organocatalysis. Here, I developed new catalytic methods for the building of pharmacologically active molecules.

My recent research efforts have been focused on developing new materials (materials science). A noteworthy example includes my work on the chemical modification of nanocellulose. Displaying the potential applications of these materials in biomedicine, particularly in the treatment of chronic wounds. In my current role at the Department of Surgical Sciences, Orthopaedics, and Handsurgery, I play a pivotal role as a lab manager in a dynamic multidisciplinary team comprised of clinicians and basic science researchers. Our primary focus is bone tissue engineering. Within this scope, we are actively involved in the development of innovative biomaterials, employing cutting-edge techniques such as 3D-bioprinting for bone regeneration. Our research stands out for its innovative contributions, catching the attention of clinicians and basic science researchers. As evidence of its impact, I was invited to present a talk during the University Hospital's Osteoarticular Surgery and Traumatology Clinical Session at Hospital Puerta del Mar. I am currently a researcher associated to AM4Life, a Competence Centre in Additive Manufacturing for the Life Sciences, gathering 25 partners from academia, healthcare and industry, that work together to develop, provide and support a future supply of competence, technology and spin-offs in the field. Regarding industry, I worked for Eurofins Villapharma Research SLU, a company that offers services for organic synthesis and medicinal chemistry with expertise in a wide range of chemistry. Here, I developed new synthetic routes for valuable pharmaceutical compounds.

In a new line of research, I would like to find greener and more efficient methods to incorporate bioactive compounds to biopolymers in order to develop new biomaterials with potential biological activity, e.g. antimicrobial.

**Resumen del Currículum Vitae:**

During my PhD I have participated as researcher in different projects funded by "Junta de Andalucia" and "Gobierno de Espana". Here, I have been working at the chemistry part of the projects, optimizing and developing the synthesis of compounds with pharmacological activity. In terms of internationalization, I have developed the majority of my scientific career in foreign countries (10 years). During this period, I have been working at high quality research universities. During my PhD, I got funding to carry out two short stays (2011, 2012) at Stockholm university, producing publications in high impact factor journals, such as Angewandte int. ed. Here, I learned how to work, at a high-quality level, in heterogenous organic and metal catalysis. After finishing my PhD, I joined Mid Sweden University as a postdoc to work on the same topic. Also, I participated in the design and optimization of the reactions that produced two patents. Afterwards, I was a short-time working at Eurofins Villapharma, working on the synthesis of new molecules. In 2015, I was granted by the Royal Society with the Newton International fellowship to join Bristol University. The work produced here has been published in journals related with the field, e.g., JACS. Furthermore, during the last five years I have been funded by Royal Society with Newton Alumni to carry out my own research in collaboration with Bristol University. In these projects I have been the principal investigator and has produced interesting results that will soon be published. Thereafter, I moved to Uppsala University to the department of medicinal chemistry participating in different medicinal chemistry projects (2017-2019). Since 2019, I have been working in the field of materials science in a multidisciplinary group at the Department of Materials Science and Engineering, Nanotechnology and Functional Materials and the Department of Surgical Sciences, Orthopaedics, and Handsurgery. My role as the only material chemist in both groups, is to design and carry out the chemical modification of biopolymers, to provide the material with antimicrobial activity. In 2023, I have gotten a new position as lab manager in the Department of Surgical Sciences, Orthopaedics, and Handsurgery. In this position, I stand the responsibility for overseeing and guiding the conceptualization of various projects within the department. In our group, we are working on developing new materials that can be used in bone tissue engineering.

During these years I have established a network with a multidisciplinary research team to meet our project goals. A collaboration has been established with Prof. Corine Sandström and Prof. Mikael Hedeland (Uppsala, Sweden), to get a further characterization of the materials, and with Prof. Ulf Göransson for the synthesis and modification of antimicrobial peptides of interest. Furthermore, an ongoing collaboration persists with Prof. Carmen Galan. Additionally, I maintain a collaborative partnership with U-print, a facility offering valuable support for a diverse range of projects related to 3D printing. Furthermore, I am co-supervisor of one PhD student (M. Kontakis) and main supervisor of two master students (R. Olsson and F. Akbari). In the last years, I have been the main supervisor of 4 master students and and I have teaching experience at both Uppsala University and Bristol University

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | ESCOBAR GONZÁLEZ, LUIS |
| **Referencia:** | RYC2023-042793-I |
| **Correo Electrónico:** | luisescobar1992@hotmail.es |
| **Título:** | MTI_Escobar |

**Resumen de la Memoria:**

I developed my research career in 6 institutions of 4 different countries, working on the fields of Supramolecular Chemistry, Polymer Science, Chemical Biology and Prebiotic Chemistry. I completed my PhD with Prof. Pablo Ballester at the Institute of Chemical Research of Catalonia (ICIQ). My thesis was focused on molecular recognition processes using macrocyclic receptors featuring polar cavities. I used aryl-extended and super aryl-extended calix[4]pyrroles for the quantification of non-covalent interactions and the hydrophobic effect. I also applied calix[4]pyrrole derivatives in the self-assembly of capsules and cages, as well as in the modulation of chemical reactivity. During my PhD, I did an internship with Prof. Jonathan L. Sessler at The University of Texas (UT) at Austin to study chemical communication systems based on calix[4]pyrrole architectures. After that, I performed my first postdoc with Prof. Thomas Carell at the Ludwig Maximilian University (LMU) of Munich. My research involved the development of a primitive translation system to understand the origin and evolution of the ribosome. I used modified RNA strands to probe the capture of amino acids and the formation of peptides. I also proposed the RNA-peptide world theory based on conserved non-canonical nucleosides. Currently, I am doing my second postdoc with Prof. Christopher A. Hunter at the University of Cambridge (UoC). I focus on artificial melamine oligomers equipped with recognition units to mimic the replication process. During my career, I also established fruitful collaborations with other 7 internationally recognized research groups and 1 specialized company. These projects were supported by public and private funding agencies, in which I participated as a researcher leading several work packages. In addition, I obtained 3 individual PhD and postdoc fellowships from highly competitive national and international calls to develop my own research proposals, and I am the Principal Investigator (PI) of a project that is currently preselected and scheduled for final interview.

For the development of the projects, I used nuclear magnetic resonance (NMR), UV-vis spectroscopy, and isothermal titration calorimetry (ITC) for the characterization of supramolecular complexes. I obtained structural information of the formed complexes by X-ray diffraction and dynamic light scattering (DLS). I prepared natural and artificial oligomers using automated solid-phase synthesizers, and I analyzed reactions by liquid chromatography (LC) and mass spectrometry (MS). I also applied semi-empirical and density functional theory (DFT) methods to optimize molecular modelling structures. In addition, I was responsible for the training and equipment of LC, MS and ITC units at ICIQ, LMU and UoC.

My goal is to pursue an independent career doing research in fundamental and practical applications of Supramolecular Chemistry and Chemical Biology. If awarded, the "Ramón y Cajal" (RyC) fellowship will allow me to develop my research proposal on functional nucleic acid-peptide nanostructures assembled by host-guest systems for nanotechnology applications, and to establish my own research group in a Spanish institution. The innovative and interdisciplinary nature of the proposed project will place me in a unique and leading position in this research area.

**Resumen del Currículum Vitae:**

From 2010 to 2014, I studied my Bachelor Degree in Chemistry at the University of Castilla-La Mancha (UCLM), supported by general fellowships from the "Ministerio de Educación, Cultura y Deporte" (MECD). Within this period, I was also awarded collaboration fellowships from MECD and La Caixa to work with Prof. Ester Vázquez at UCLM and Prof. Pablo Ballester at the Institute of Chemical Research of Catalonia (ICIQ), respectively. In 2014, I completed my Bachelor Degree, and I received the extraordinary Bachelor award from UCLM. After that, I moved to the University of Rovira and Virgili (URV) and ICIQ to pursue my Master Degree and PhD. I studied by Master Degree supported by a Master fellowship from ICIQ. In 2015, I obtained an "Ayuda para la Formación de Profesorado Universitario" (FPU) fellowship from MECD to perform my PhD in Supramolecular Chemistry with Prof. Pablo Ballester at ICIQ. During my PhD, I did an internship of 3 months with Prof. Jonathan L. Sessler at The University of Texas (UT) at Austin, thanks to a complementary PhD fellowship from MECD. In 2019, I obtained my PhD with the qualification of Cum Laude and international distinction, the extraordinary PhD award in Chemical Science and Technology from URV and ICIQ, and the recognition of my PhD in Chemistry from the "Sociedad Catalana de Química" (SCQ). In 2020, I was awarded a postdoctoral Humboldt Research fellowship from the Alexander von Humboldt (AvH) Foundation to work on Chemical Biology and Prebiotic Chemistry with Prof. Thomas Carell at the Ludwig Maximilian University (LMU) of Munich. From 2023, I am working as a postdoc on Supramolecular Chemistry and Polymer Science with Prof. Christopher A. Hunter at the University of Cambridge (UoC). Overall, I participated as a researcher in 5 projects supported by public and private funding agencies, and I am the Principal Investigator (PI) of a project that is currently preselected and scheduled for final interview. I am co-author of 18 high-quality papers published in high-impact and peer-reviewed scientific journals (3 corresponding and 11 first author papers). My h-index is 12 and the average impact factor (IF) of my publications is 15.3 (Web of Science). I also communicated my results in 13 invited talks/conferences (3 invited talks, 3 oral presentations and 7 posters). In addition, I received the "Real Sociedad Española de Química" (RSEQ) postdoctoral research award, and I was selected as an emerging talent in Systems Chemistry by the journal ChemSystemsChem from Wiley in 2023.

Apart from that, I co-supervised 3 Bachelor and 3 Master students, and I was responsible for a subgroup of 5 PhD students in the Carell lab. I participated in the evaluation of Bachelor and Master theses. I acted as internal and external member of 3 PhD committees at URV and the University of Barcelona (UB). I am also a reviewer of scientific journals, like RSC Advances. In addition, I completed 126 h of General Chemistry laboratories for undergraduate students at URV, I disseminated my results in the public media and as 3 blog publications, and I prepared and participated in 2 outreach activities for high-school students at LMU and UoC. Finally, I obtained the certification of "Profesor Ayudante Doctor" (PAD) from the "Agencia Nacional de Evaluación y Acreditación" (ANECA).

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | BHARMORIA , PANKAJ |
| **Referencia:** | RYC2023-042922-I |
| **Correo Electrónico:** | pbharmoria@icmab.es |
| **Título:** | Bio-Photophysical Chemist |

**Resumen de la Memoria:**

Pankaj Bharmoria (PB) is an experimental "Bio-photophysical Chemist" with cross-disciplinary research expertise at the interface of physical chemistry, photo-physics, and biology. He did a Ph. D. in biophysical chemistry from AcSIR-Central Salt and Marine Chemicals Research Institute (CSMCRI) India under the supervision of Dr. Arvind Kumar. His thesis research was focused on the biophysical, and spectroscopic analysis of structural/functional alterations of globular proteins upon interaction with the colloidal structures (micelles & vesicles) of surface-active ionic liquids. Other than thesis work Pankaj also contributed to CSMCRI' s research line, "explore, harness and transform marine resources from Indian coastline." He worked on the extraction and processing of biopolymers (agarose & poly-hydroxy-alkanoates) from marine resources. He also worked on a fundamental understanding of exceptional temperature-dependent aqueous solubility NaCl/Na2SO4 that played a key role in separating the NaCl/Na2SO4 mixture from the tannery waste.

His research trajectory changed during the JSPS-Post-doc in Prof. Kimizuka Lab at Kyushu University Japan where he started working on photon-energy harvesting via triplet-triplet annihilation photon upconversion. During this period, he discovered a new concept of biopolymer-surfactant-chromophores co-assembly to stabilize the chromophores triplet-state for photon upconversion in air. After completing his JSPS grant Pankaj moved to CICECO-Aveiro University Portugal where he worked with Prof. Luis Carlos and Joao A. P. Coutinho to develop a protein-cohabitation concept for the photo-stable fabrication of phycobiliproteins for solar concentration. In the meantime, he was awarded a Marie Sklodowska Curie post-doctoral fellowship with Prof. Kasper Moth-Poulsen at Chamers University of Technology, Sweden. As an MSCA fellow Pankaj developed recyclable Red/NIR sensitized TTA-UC bioplastics as solid-state solar energy harvesters and photo-switching bioplastics for photon energy storage.

After finishing MSCA Pankaj briefly came back to Ionic-protein research to develop anti-cancer ionic liquid-peptide conjugates in Alesia Tietze's lab at Gothenburg University, Sweden.

In the meantime, he got the La-Caixa junior research leadership grant at ICMAB-CSIC Spain, where he is currently working independently on the development of upconversion crystals-doped bacterial cellulose bioplastics for solar energy harvesting. His other research is focused on the exploration of low-intensity (5-30 mW cm-2) NIR-sensitized photoisomerization of photo-switch labelled drugs for photo-pharmacology as an alternative to 2 & 3 photon absorption (2PA & 3PA) which functions in the range of 10s of W cm-2

**Resumen del Currículum Vitae:**

La-Caixa Junior Research Leader (Bio-Photophysical Chemist)
Instituto de Ciencia de Materiales de Barcelona (ICMAB-CSIC), Bellaterra, 08193, Spain
Mobile No. +34-631190558, Email: pbharmoria@icmab.es
Webpage:  sites.google.com/view/pankajbharmoriahomepage/profile
Homepage: https://www.icmab.es/bharmoria-pankaj-eu-marie-curie-researcher
ORCID: orcid.org/0000-0001-6573-0475

Education and Degrees

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| 2008 | BSc. (Chemistry, Biology), Himachal Pradesh University, India |
| 2010 | MSc. (Physical Chemistry), Himachal Pradesh University, India |
| 2015 | PhD. (Biophysical Chemistry), AcSIR-Central Salt and Marine Chemicals Research Institute, India |

Positions

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| 10/2022- Present | La-Caixa Junior Research Leader, ICMAB-CSIC, Barcelona Spain |
| 02/2022-08/2022 | Researcher, Deptt. of Chemistry and Molecular Biology, Gothenburg University, Sweden |
| 01/2020-12/2021 | Marie Sklodowaska Curie Post-Doc Fellow at Deptt. of Applied Chemistry, Chalmers University of Technology, Sweden |
| 02/2019-12/2020 | Post Doc Fellow at Department of Chemistry, CICECO-Aveiro University, Portugal |
| 08/2016-08/2018 | JSPS Post Doc Fellow, Deptt. of Chemistry and Biochemistry, Kyushu University, Japan |
| 01/2016-06/2016 | Post Doc Fellow at Department of Chemistry, CICECO-Aveiro University, Portugal |

Grants & Scholarships

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| 2023& | Awarded Cancerfonden Grant, No. 222409Pj, Sweden (2.4 M SEK, 3 Y) |
| 2022 | Winner PASIFIC-MSCA Co-fund postdoctoral grant, Poland (182 K € 2 Y) |
| 2022& | Winner, La-Caixa incoming Junior Leader grant, Spain (305.1 K € 3Y) |
| 2019 | Winner, Marie Skłodowska-Curie post-doctoral-grant, European Commission, EU  (203 K € 2Y) |
| 2016 | Winner, Japan Society of Promotion of Sciences, Post-Doctoral Fellowship, Japan (11.8 M Yen, 2 Y) |
| 2012 | Winner, Department of Science and Technology grant, India (3.3 M INR, 3 Y) |

Research Expertise

2016-present    Photon harvesting and photoswitching in recyclable photonics bioplastics and hydrogels
2019-20         Protein-cohabitation for long-term chemical stability in the solid-state at room temperature
2010-15              Ionic liquid surfactant (SAILs)-protein biophysical chemistry, spectroscopy, Self-assembly of SAILs,    micelles/ vesicles/micro/nanoemulsions, brine equilibrium for extraction & purification of marine chemicals.

Publications
Overview of publication records (June. 2023)

No. of publications (Articles + book chapters)    42 + 3

Total no. of citations  1538 Google Scholar
Hirsch index            21, Google Scholar

 Presentations, and Citations

Invited talks or Oral presentations at International Conferences and Universities      18
Poster presentation or participation in national/international conferences             10

Supervision

Ph. D                   01    (Currently Supervising)
Master' s Thesis        08    (2011 − 2023)
Undergraduate Thesis    02    (2011 − 2023)

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | CLIMENT BIESCAS, CLAUDIA |
| **Referencia:** | RYC2023-044128-I |
| **Correo Electrónico:** | claudiacliment@gmail.com |
| **Título:** | Molecular Spin Polaritonics |

**Resumen de la Memoria:**

My scientific trajectory and research accomplishments can be classified mainly into three broad areas. The first one is related to my PhD research at the University of Barcelona, devoted to investigate photochemical and photophysical processes of organic and organometallic compounds that have practical applications in the realm of optoelectronic devices. By means of electronic structure calculations with quantum chemistry methods I investigated a wide range of molecular systems in collaboration with experimental groups that synthesized these compounds. The main goal of these joint research projects was to rationalize the experimental observations with my calculations and suggest new experiments based on the insights gained from the theory side. The second major area in which I have worked on is polaritonic chemistry, where hybrid light-matter states known as polaritons are formed when either vibrational or electronic states of molecules strongly interact with photons in cavities or plasmonic modes. During my first postdoctoral period at the Autonomous University of Madrid, I studied how chemical processes are modified under these circumstances. One of my main efforts focused on understanding several experiments in which thermal reactions are modified in cavities under vibrational strong coupling conditions when there is no external light source. During my second postdoctoral experience at the University of Pennsylvania I have continued working in the field of polaritonic chemistry, mostly in the electronic strong coupling regime. I have also started to work in a third major research area related to phenomena involving chirality and spin, focusing on different aspects of the interaction of circularly polarized light with chiral molecules as well as hyperfine interactions in radical pairs, among other topics.

The first demonstration of modified chemical phenomena under strong light-matter interactions was reported about a decade ago, inaugurating the field of polaritonic chemistry. This strong light-matter coupling regime can be achieved in cavities formed by two facing mirrors that can trap a photon and thus strengthen its interaction with matter, leading to the formation of hybrid light-matter states called polaritons. This field has attracted a lot of interest because of its ability to manipulate both ground and excited state chemical processes in non-conventional ways by coupling either vibrational or electronic transitions of molecules with cavity photons. So far, research efforts have focused on the consequences of either vibrational or electronic strong coupling on thermal reactions and photochemical / photophysical processes. The main research line I aim to develop during the following years will go one step beyond and explore the possibilities offered by coupling microwave cavity photons to transitions between spin states. I label this regime as spin strong coupling, where the spin transitions traditionally probed by electron paramagnetic resonance are the ones coupled to the cavity (resonator) photon. My main goal with this new research line is to gain fundamental understanding on how strong coupling between spin transitions and cavity photons affects the spin dynamics of several chemical systems of experimental relevance for quantum information technologies.

**Resumen del Currículum Vitae:**

After earning a BSc in Chemistry at the Universitat de Barcelona (UB, 2012) and a interuniversity MSc in theoretical and computational chemistry (2013), I decided to pursue a PhD in Nanoscience at the UB under the supervision of Dr. David Casanova and Prof. Pere Alemany, funded by an FPI graduate fellowship. In 2017 I defended my PhD thesis entitled "Theoretical study of excited states in molecules and molecular aggregates relevant for optoelectronic applications" with cum laude and international distinctions.

My research evolved when I became a postdoc in 2017 at the Universidad Autónoma de Madrid (UAM) in the group of Dr. Johannes Feist, hired within his ERC Starting Grant to work in the field of polaritonic chemistry. My main goal during this period was to understand how the energy landscape is modified in systems where molecules interact with cavity photons or plasmonic modes forming polaritons (hybrid light-matter states), how the dynamics is affected, and also to explore its implications in catalysis and excited state phenomena. Because of my scientific contributions, in 2021 I was awarded the "Emerging scientific talent in Chemistry" prize by the Catalan Society of Chemistry (1k€).

In October 2021 I moved to the University of Pennsylvania (Penn) for my second postdoctoral experience working in the groups of Profs. Joseph Subotnik and Abraham Nitzan. I obtained two fellowships for developing my research in the US: the Vagelos Institute for Energy Science and Technology fellowship from Penn ($57k) and the Marie Sklodowska-Curie individual global fellowship (245k€). During this period I have investigated several aspects related to molecular polaritonics, chirality, spin chemistry phenomena, and semiclassical dynamics. These investigations have resulted in five manuscripts, two of which I am corresponding author.

In changing fields after my PhD, I had to learn from disciplines such as quantum optics, nanophotonics and plasmonics, demonstrating my ability to quickly adapt to a new and different research area. In addition, because of my passion for learning, during my PhD years at UB I also studied (in-person) a BSc in physics (which I completed during my postdoc at UAM), complementing my original training as a chemist, allowing me to build bridges between communities in a physicist-dominated area. During my academic life I have been exposed to diverse research environments that have shaped my multidisciplinary character. I have also carried out short research stays at the Institute of Radical Chemistry of Aix-Marseille Université in France within the group of Prof. Mario Barbatti (2016), and also in the group of Prof. Gerrit Groenhof at the Nanoscience Center of the University of Jyväskylä in Finland (2018).

During my academic career I have published more than 30 manuscripts and 1 book chapter. I have delivered a total of 1 plenary talk, 12 invited talks, 10 contributed talks, and presented 14 posters at international conferences, university departments, and research institutes. I have also been a teaching assistant in two courses of the BsC in Chemistry of the UB (2014-2016). Since 2018 I have refereed ~30 manuscripts for more than 15 scientific

journals in the areas of general chemistry, physical chemistry, theoretical and computational chemistry, inorganic chemistry, materials chemistry, and general & quantum physics.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | GAMERO QUIJANO, DANIEL ALONSO |
| **Referencia:** | RYC2023-045723-I |
| **Correo Electrónico:** | daniel.gamero@ua.es |
| **Título:** | Bioelectrochemistry and Electrosynthesis at polarised aqueous|organic interfaces |

**Resumen de la Memoria:**

With 8 years of postdoctoral experience in three European countries (France, Ireland and Spain), I am an independent researcher with a consolidated career in two different areas: conventional electrochemistry (electrode|electrolyte interface) and electrochemistry at aqueous|organic interfaces (a.k.a liquid|liquid interfaces, oil|water interfaces). My current research is rooted in bioelectrochemistry at biomimetic membranes assembled at polarised aqueous|organic interfaces, and it is divided into two different projects:

(a) Amyloid fibril formation at polarisable aqueous|organic interfaces

I will explore a new field of liquid-liquid phase-separated organic electrochemical transistors (LiPS OECTs). LiPS OECTs is an emerging technology that I have identified as the perfect platform to apply my recent findings and develop sophisticated dual-mode electrochemical monitoring platforms. I will develop a disruptive dual-mode electrochemical immunoassay platform that incorporates biomimetic liquid-liquid interfaces and conducting polymers to detect amyloid monomer and oligomer proteins, early-stage indicators of neurodegenerative diseases  As amyloid fibril formation is a common pathological event in neurodegenerative diseases, breakthroughs during my research may lead to the discovery of a common mechanism underlying the pathogenesis of a host of chronic diseases and the development of wide-spectrum therapeutics (e.g. for Parkinson's, Alzheimer's, Lewy bodies, Type II diabetes mellitus, cataracts, prion disease, among others).

(b) Mimicking the mitochondrial respiratory electron transport chain at polarisable aqueous|organic interfaces.

This line of research will aim to mimic the respiratory electron transport chain of mitochondria, where interprotein electron transfer chain reactions occur at the boundaries of the mitochondrial membrane. This research topic will be a proof-of-concept of the thousands of biological systems that could be tailored and attained at an electrified aqueous|organic interface.

Both research topics (a) and (b)are of major relevance, with a high impact on a better understanding of the processes and factors leading to neurodegenerative diseases and cancer.

My research is multidisciplinary and presents a unique approach to unlock unexplored systems in multiple fields (e.g., bioelectrochemistry, biology, biophysics, medicine and energy storage). I have acquired a multidisciplinary and entirely unique background in the areas of fundamental electrochemistry, bioelectrochemistry, electrochemistry at aqueous|organic interfaces, polymer electrosynthesis (e.g. surfactant-free biocompatible conductive polymers) with in-depth characterisation techniques (in-situ and ex-situ). I have an outstanding scientific track record, as an independent researcher, I am the recipient of the 4-year SFI-Pathway programme (22/PATH-S/10641, €561 128.00). Furthermore, this January 2023, I was awarded the 5-year Cesar Nombela-Fellowship (T1/TEC-29227, €593 088.09, date of incorporation to be agreed). Hence, I have secured over 1 million euros in funding as the principal investigator through highly competitive international research programs. Even more encouraging is that my two independent research projects, MimiChron and EMINT, define the two lines of research that I want to pursue in Spain.

**Resumen del Currículum Vitae:**

I am an independent researcher with a consolidated career in two different areas: conventional electrochemistry (electrode|electrolyte interface) and electrochemistry at aqueous|organic interfaces (a.k.a liquid|liquid interfaces, oil|water interfaces). I have made significant experimental breakthroughs in two specific research topics: (i) bioelectrochemistry at polarised aqueous/organic interfaces and (ii) the synthesis of biocompatible polymeric

My research is multidisciplinary and presents a unique approach to unlock unexplored systems in multiple fields (e.g., bioelectrochemistry, biology, biophysics, medicine and energy storage). I have acquired a multidisciplinary and entirely unique background in the areas of fundamental electrochemistry, bioelectrochemistry, electrochemistry at aqueous|organic interfaces, polymer electrosynthesis (e.g. surfactant-free biocompatible conductive polymers) with in-depth characterisation techniques (in-situ and ex-situ).

I have an outstanding scientific track record, and I am and was a recipient of prestigious grants. As an independent researcher, I am the recipient of the 4-year SFI-Pathway programme (22/PATH-S/10641, €561 128.00). Furthermore, this January 2023, I was awarded the 5-year Cesar Nombela-Fellowship (T1/TEC-29227, €593 088.09). Hence, I have secured over 1 million euros in funding as the principal investigator through highly competitive international research programs. Even more encouraging is that my two independent research projects, MimiChron and EMINT, define the two lines of research that I want to pursue in Spain.

I have been the recipient of the Marie Sklodowska-Curie Individual Fellowship (Spain) and the Irish Research Council Postdoctoral Fellowship (Ireland). Furthermore, I have been awarded several international mobility grants, such as the prestigious Spanish grant for talented researchers "CIBEST-Generalitat Valenciana" mobility Grant (2023), ISE travel Grant Division 2 (2022) and the prestigious French-Irish "Ulysses" international mobility Grant (2016). During my postdocs in France, Ireland and Spain, I have co-supervised 7 PhD candidates, 3 Master students, and 3 undergraduates, and currently, I am co-director of 1 PhD thesis in Spain. I have produced multidisciplinary research of the highest calibre (articles published in JACS, Science Advances, Chemical Sciences, Chem Commun, Current Opinion in Electrochemistry) and established a vast multidisciplinary network of renowned researchers from Ireland, France, Canada, Finland, Australia, Japan, Poland, UK, USA, and Spain.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | PIGLIACELLI , CLAUDIA |
| **Referencia:** | RYC2023-045898-I |
| **Correo Electrónico:** | claudia.pigliacelli@polimi.it |
| **Título:** | Peptide-based and hybrid nanoscale materials: towards dynamic systems |

**Resumen de la Memoria:**

I am a pharmaceutical chemist and, after working for a year in the private sector, I chose to pursue a PhD in 2010. Since then, I have been conducting research in several European Universities studying a wide range of topics revolving around nanomaterials synthesis and self-assembly, peptide science and drug delivery. My current research activities cross several disciplines, from peptide synthesis and supramolecular chemistry to colloids, and mostly focus on the design of peptide-based and hybrid nanoscale materials, whose application is not limited to a single field, but mostly falls in the biomedical one.

I gained my PhD in 2015 from the University of East Anglia under the supervision of Prof. Sheng Qi and Prof. Pete Wilde. During my predoctoral appointment, I developed a solid background in colloid science and drug delivery fields, with particular emphasis on the physical-chemical behavior of polymeric carriers in simulated biorelevant fluids. Part of the project was run in the Institute of Food Research where I gained complimentary skills in colloid science and in cell-culture laboratory work.

In October 2013, I joined the Centre of Nanomedicine and the Department of Chemistry, Materials and Chemical Engineering (DCMC) in Politecnico di Milano (PoliMI) as Research Assistant first (October 2013-February 2015) and Postdoc from March 2015. During this new appointment, I activated, together with the coordinator, Prof. F. Baldelli Bombelli, a new research line on gold and magnetite nanoparticles to be employed as nanomedical systems.

In March 2016, I joined the Molecular Materials Group at the Applied Physics department of Aalto University (Finland) under the supervision of Prof. P. Metrangolo and O. Ikkala. During this experience, I started working with peptide-based nanomaterials and peptide-gold hybrid superstructures and atomically precise gold nanoclusters. Notably, the postdoctoral experience in Aalto University, gave me the opportunity to be trained in several electron microscopy techniques in the OtaNano microscopy center, becoming and independent user of TEM and SEM.

In February 2020, I started working as Senior Postdoc in the Centro the Investigaciòns Científicas Avanzadas (CICA) in Spain in the group of Prof. Elena Pazos. This short (7 months) Postdoc appointment gave me the opportunity to gain stronger skills in peptide design, synthesis and functionalization for the development of custom functional nanoscale systems.

In September 2020, I joined the Chemistry, Materials and Chemical Engineering department (DCMC) of Politecnico di Milano as Junior Assistant Professor and got promoted to a Tenure Track-Assistant Professorship in 2023. During this time at Politecnico di Milano, together with using the research skills and techniques acquired during my predoctoral and post-doctoral experiences, I am gaining new skills in scattering techniques, being trained in the advanced use of Small Angle X-Ray scattering in the new NEXTGame laboratory that hosts advanced X-Ray scattering facilities.

**Resumen del Currículum Vitae:**

I gained my PhD in 2015 from the University of East Anglia (UEA, UK) under the supervision of Prof. Qi from the UEA and Prof. Wilde from the Quadram Institute (Norwich, UK).

Following my PhD, I had an extended postdoctoral training in several institutions across Europe (Politecnico di Milano – Prof. Francesca Baldelli Bombelli; Aalto University – Prof. P. Metrangolo and O. Ikkala; Univeridade da Coruña – Prof. Elena Pazos). In 2020, I joined the Department of Chemistry, Materials and Chemical Engineering of Politecnico di Milano (PoliMI) as Junior Assistant Professor and got promoted to a Tenure-track position in September 2023. My current research aims mostly focus on the design of functional peptide-based and hybrid nanoscale materials, whose application is not limited to a single field, but mostly falls in the biomedical one. Since I joined PoliMI, I have supervised 1 PhD (graduated in April 2023) and 2 Master's Students. I am currently mentoring 1 second year PhD student and 4 Master's students.

My research output is characterized by publications in several journals in the field of Nanotechnology and Chemistry, including 2 ACS NANO., Angew. Chem. Int. Ed., Chem. Soc. Rev., 2 Small, JCIS, 2 Chem. Eur. J and Chem. Sci. I'm corresponding author in 6 of my publications. Furthermore, some of the results obtained by the PhD work of the student that I currently supervise have been protected by a patent that has recently been deposited.

My research results have been presented in national and international conferences , 9with oral presentation and 11 with poster presentation. I have been member of the organizing committee of the PhD school "1st School of "Supramolecular and Bio Nanomaterials", Como, Italy https://sbn.lakecomoschool.org and I am currently organizing, together with the other members of the commission, the second edition. Below a selection of seminar and conferences oral contributions.

During my career, I demonstrated to be able to conceive and write research projects to rise my own funding, being awarded the MSCA SEAL OF EXCELLENCE @ POLIMI 2018 Postdoctoral fellowship, (100.000 €) after receiving the Seal of Excellence for the research proposal "SupraGoldHalo" Submitted under the Horizon 2020's call H2020-MSCA-IF-2018. I have also participated as Co-PI and Team member to several national and international research projects.

I have worked as expert reviewer for the Irish Research Council, Israel Science Foundation and National Science Centre Poland as well as for several journals including ACS, RSC and Elsevier journals. As a result of my research and teaching experience, I have achieved the National Scientific qualification as associate professor in the Italian higher education system, for the disciplinary field "Principles of chemistry for applied technologies.

MINISTERIO
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**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Ciencias y tecnologías químicas
**Nombre:** MESA ZAMORA, CAMILO ARTURO
**Referencia:** RYC2023-045597-I
**Correo Electrónico:** camilo.mesa@icn2.cat
**Título:** GUIdelines to DEsing efficient electrocatalysts for high value-added CHEMicals (GUIDEeCHEM)

**Resumen de la Memoria:**

Followed by an international academic pathway based on mobility between different countries between America and Europe, I consider I have the merits to start my independent pathway, thus the Ramón y Cajal fellowship becomes a cornerstone in this process. In particular, I have studied, worked and performed research in 7 different countries (Colombia, Brazil, Cuba, Sweden, Italy, United Kingdom and Spain) and I have been invited to present my research work in 5 different countries (Italy, Colombia, United Kingdom, Brazil and France), publishing >30 research papers in prestigious journals such as Nature Chemistry, JACS and ACS catalysis, amongst others. Fruthermore, I have acquired and demonstrated my leadership skills by leading associations and projects (at Universidad Nacional de Colombia – UN and Imperial College London – ICL), working as part or organized groups (UN, ICL and the Institute of Advances Materials – INAM) and leading scientific projects at both ICL and INAM and will be taking the lead of the spectroscopic characterization in my new position at ICN2. More importantly, having mentored 3 M.Sc students, 2 PhD students (one graduated and the other one defending the thesis shortly) and co-suppervising other 2 PhD showing my leadership and projection as PI, having involved in funding aquiring of < 1.7M€, I believe I am in a position to start my own research group with the following "GUIdelines to DEsing efficient electrocatalysts for high value-added CHEMicals (GUIDEeCHEM)" proposal.

Efficiently storing renewable energy into chemical bonds, such as hydrogen (H2) or C-based fuels from CO2, is crucial to ensure the decarbonisation of sectors such as transportation, industry and heating. This is of key importance towards achieving the sustainable development goal (SDG) 7 (Affordable and clean energy) and the recently increased CO2 emissions reduction targets, set by the United Nations and the European Union, respectively. When coupling this process with both wastewater treatment or fine chemicals production, SDGs such as Clean water and sanitation (SDG 6) and Sustainable cities and communities (SDG 11) are also tackled. A promising technology to accomplish such goals is using renewable electricity to produce green H2 or C-based fuels via electrochemical water splitting (2H2O -> O2 + 2H2) or CO2 reduction, especially when coupling this process with the oxidation of waste such as glycerol or biomass platform molecules such as 5-Hydroxymethylfurfural (HMF). This is particularly important in Europe where roughly the 70% of the H2 is produced by natural gas steam reforming with a high CO2 footprint and where countries such as Spain are producing roughly 90 000 Ton of waste glycerol per year.2 Thus, this research line will study state-of-the-art electrocatalysts for water splitting and alcohols oxidation aiming to reveal routes to improve the catalyst efficiency, product selectivity and stability and will deliver a set of rules to control the selectivity of produced high added-value chemicals upon oxidation of low molecular weight alcohols.

**Resumen del Currículum Vitae:**

I am a chemist educated with strong research and dissemination skills focusing the work I do towards a more rational and sustainable use of our natural resources. Throughout my M.Sc., PhD and postdocs, I have developed my scientific thinking and independence in the field of (photo)electrocatalysis for water splitting, CO2 reduction and alcohols oxidations, in addition to contributions to the perovskite nanocrystals field. The quality of my research has been recognized with the first prize for best thesis at University of Bologna and Imperial College London for both my M.Sc. and PhD theses, respectively.

I completed my PhD at Imperial College London (2014-2018) elucidating the oxygen evolution reaction mechanism in metal-oxide photoanodes and providing synthetic guidelines to boost catalytic activity. As a result of my PhD work I co-authored a book chapter in a Royal Society of Chemistry book and 12 peer-reviewed papers in journals like JACS (>100 cites) and Nature Chemistry (>160 cites). During my postdocs first at Imperial College and then at INAM, I have focused on studying the role of solid-state defects, such as oxygen vacancies, on boosting or reducing catalytic activity towards green hydrogen production, the oxidation of alcohols to produce high value-added chemicals and the reduction of CO2 to obtain carbon-based fuels from renewable energies. From my research in the role of oxygen vacancies in the photoelectrochemical behaviour of different metal-oxide photoanodes, I have co-authored 4 publications (including JACS and Solar RRL, receiving a combined >160 cites), two of which I am corresponding author. I have also been able to lead a new research line during my postdoc on the oxidation of alcohols, such as glycerol to both, increase (photo)electrochemical green hydrogen production and produce valuable chemicals from an industrial waste. In general, my research activity has led to impactful publications (>30 publications, >1600 cites) and contributions at conferences, including, thanks to my contributions to the water splitting reaction mechanism field, the invitation to co-write a News and views article for Nature Catalysis.

My academic career have and is currently providing mentoring and project management skills. In particular, mentoring 2 M.Sc. and 1 PhD students at Imperial College London, 4 more PhDs at INAM and training new postdocs show leadership and mentoring abilities. I recently moved to ICN2 as senior postdoc where I am in charge of research activities coordination and students and postdoc mentoring. Furthermore, I have been able to successfully coordinate 5 synchrotron proposals, at Diamond and ALBA Light Sources to continue developing my research lines. Additiona, I have been able to train my skills to write project proposals by co-writing two EU-H2020 projects (SUN2CHEM, P884444 and OHPERA, P101071010), one project by the Spanish Ministry of Science (ECOCAT), securing more than 1M € As Principal Investigator I have been granted 2 projects (VATFromSUN and REVCHEM) funded by University Jaume I and the Generalitat Valenciana, respectively, to develop both my research on the study of defects and the oxidation of alcohols (150k €). Co-organising 2 symposia at the MATSUS23 and 24 Fall conferences, respectively, have been strengthening my leadership and organisational skills.

**Área Temática:** Ciencias y tecnologías químicas
**Nombre:** SALINAS RODRÍGUEZ, BEATRIZ
**Referencia:** RYC2023-043741-I
**Correo Electrónico:** bsalinasr@gmail.com
**Título:** Radioquímica aplicada al desarrollo de agentes de imagen

**Resumen de la Memoria:**

Durante los últimos 16 años, mi carrera investigadora se ha centrado en la aplicación de herramientas químicas (radioquímica y nanotecnología) al desarrollo de nuevos agentes de imagen para la obtención de imágenes biomédicas. En 2006, durante el último año de la licenciatura en Química, realicé la especialización en Radioquímica en la Universidad Técnica de Dresde (Alemania). Mi trabajo de doctorado en la UCM (2009-2013), basado en el desarrollo de nuevas estrategias químicas para la funcionalización de nanopartículas de hierro como agentes de imagen para resonancia magnética (RM) en enfermedades cardiovasculares, fue premiado con Suma Cum Laude.

En 2013 comencé mi formación posdoctoral en el departamento de Radiología del Memorial Sloan Kettering Cancer Center de Nueva York (Estados Unidos). Durante dos años, mi investigación se centró en el desarrollo de nuevos agentes de imagen para la detección del glioblastoma mediante imagen nuclear (radiotrazadores). Habiendo adquirido una formación única en el campo de la radiofarmacia, en 2016 regresé a España (IiSGM, Madrid) para poner en práctica los conocimientos adquiridos en el campo de las sondas moleculares y radiotrazadores. Aunque mi incorporación al grupo fue inicialmente como investigadora postdoctoral, mi independencia y capacidad de liderazgo me permitieron al año siguiente (2017) comenzar a liderar mi propio equipo de investigación, centrado en el desarrollo de nuevos agentes de imagen para la detección de enfermedades infecciosas y procesos oncológicos.

Actualmente soy jefe de laboratorio de "Sondas Moleculares" en el IiSGM, director del servicio de radioquímica del CNIC y del Hospital General Gregorio Marañón y profesor ayudante doctor en la UC3M. Soy director de 5 estudiantes de doctorado, un investigador postdoctoral y cinco estudiantes de grado. He dirigido 3 tesis doctorales, 9 tesis de grado (TFG) y dos tesis de máster. He participado en 25 proyectos nacionales/internacionales (8 como Investigador Principal, 4 de ellos actualmente activos) y he establecido colaboraciones con más de 20 grupos. Hasta la fecha, he logrado 24 publicaciones en revistas internacionales revisadas por pares (5 en D1, 10 en Q1), 6 de ellas como autor de correspondencia y principal (último), 4 como primer autor y 13 sin mi supervisor de doctorado. Además, soy autor de cuatro patentes, una de ellas licenciada por Aerum Lth.y actualmente en ensayos clínicos y otra ha sido finalista del premio Healthstart de la Comunidad de Madrid.

**Resumen del Currículum Vitae:**

Desde mi Licenciatura en la Universidad de Salamanca hasta mi posición actual como Profesor Ayudante en la UC3M y Jefe de Grupo Joven en el IiSGM, he obtenido becas y ayudas, contribuido a artículos de investigación, impartido conferencias, establecido colaboraciones, formado postdoctorales y de doctorado una cantidad considerable de técnicas de laboratorio. Como resumen de mi trayectoria científica:

- He publicado 23 artículos en revistas internacionales revisadas por pares (5 en D1, 10 en Q1), 6 de ellas como autor principal (último y correspondiente), 5 como primer autor y 19 sin mi supervisor de doctorado.
- Como resultado de mi trabajo de doctorado y formación postdoctoral, soy autor de cuatro patentes (dos de ellas PCT internacionales). Una de ellas está licenciada por la empresa Ariceum Ltd (EE.UU.) y en fase 2 de ensayos clínicos en India y Reino Unido.
- Me han concedido 9 proyectos competitivos como Investigador Principal (2 de ellos en convocatorias internacionales), lo que demuestra mi independencia y capacidad para obtener financiación. Durante mi trayectoria científica he participado en un total de 20 proyectos de investigación en España, Europa y EEUU. En todos estos proyectos he desempeñado diferentes roles: desde estudiante a investigador pasando por ser el investigador principal de la beca o Director Científico de las redes multidisciplinares ( Nanoliver-CM o ReNIM y ReNIM2 formadas por 6 centros de investigación), lo que demuestra mi crecimiento como científico durante estos años.
- Actualmente soy jefe de grupo del "Laboratorio de Sondas Moleculares" del Instituto de investigaciones sanitarias Gregorio Marañón (IiSGM), y Responsable del servicio de Radioquímica del Centro nacional de investigaciones cardiovasculares (CNIC) y del IiSGM. Estos puestos confirman mi liderazgo y capacidad de coordinación de equipos.
- He dirigido 3 estudiantes de doctorado, 5 estudiantes internacionales (NYC, USA), 9 tesis de licenciatura (TFG, UC3M) y 2 tesis de Máster (TFM, UAM). Además, actualmente soy el supervisor de 5 estudiantes de doctorado, 4 estudiantes de licenciatura y 1 becario postdoctoral, lo que avala mis capacidades no sólo en el liderazgo sino también en la tutoría.
- He desarrollado una parte importante de mi investigación en el extranjero proporcionándome una excepcional experiencia internacional. Durante mis estudios de licenciatura realicé mi especialización en radioquímica en la Universidad de Dresde (Alemania, 2006/07), seguida de una estancia en el Imperial College de Londres (2011) durante mi doctorado. Tras ello, mi formación posdoctoral en el Memorial Sloan Kettering Center (Nueva York , 2023/15) me ha brindado una oportunidad fantástica para de realizar investigación puntera, conocer a líderes mundiales en mi campo y crear una importante red científica. científica. Desde mi puesto de investigadora sénior, y gracias a diversas colaboraciones docentes y investigación en Múnich, he realizado tres estancias como investigador visitante (2021, 2022 y 2023) en la Universidad Técnica de Múnich. y 2023) en la Universidad Técnica de Múnich y en el hospital Rechs der Isaar.
- Esta prolífica carrera científica me ha permitido obtener la certificación R3 en 2023

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | MATO GÓMEZ, MAURO |
| **Referencia:** | RYC2023-043998-I |
| **Correo Electrónico:** | mauromato@gmail.com |
| **Título:** | Electrophilic and redox catalysis across the periodic table |

**Resumen de la Memoria:**

Mauro Mato (born in Ferrol, Spain) got his Degree in Chemistry at the University of A Coruña (2016, Extraordinary Award), were he had the opportunity to develop a brand-new project under the supervision of Prof. J. Pérez-Sestelo and L. A. Sarandeses. Then, he moved to Tarragona to get a MSc in Chemistry and Catalysis (Rovira i Virgili University, 2017, Extraordinary Award), working with Prof. A. M. Echavarren at the Institute of Chemical Research of Catalonia (ICIQ). After publishing 3 research papers before his PhD, he started his doctoral studies at ICIQ under the supervision of Prof. A. M. Echavarren (2021, cum laude, Extraordinary Award). During his PhD he also carried out a short stay at Scripps Research (San Diego, California, USA) in the group of Prof. P. S. Baran, working in collaboration with biotechnology company Vividion Therapeutics.

After a successful stay at ICIQ (resulting in 13 publications, most as first author), he moved on to the Max-Planck-Institut fur Kohlenforschung (J. Cornella Group, Mulhiem an der Ruhr, Germany), where he worked on the development of bismuth redox chemistry. There, one year later, he got a highly competitive Marie Curie Individual Fellowship, to develop his own research ideas. Thanks to this financial support, Dr. Mato pioneered the field of bismuth-catalyzed radical couplings and photochemistry, a research line that has swiftly become one of the main avenues of research in the host group. So far, his postdoctoral work has already resulted in 4 first-author papers, with 3 more currently under preparation/peer-review.

In June 2024, Dr. Mato will move to CiQUS (University of Santiago de Compostela) as a Senior Postdoctoral Researcher, in order to start his own research program, in collaboration with the group of Prof. J. L. Mascareñas.

Overall, Dr. Mato has experience in synthetic-methodology development, organometallic chemistry, catalysis, radical photoredox chemistry, total synthesis, bioconjugation and physical-organic chemistry (both experimental and DFT-based). The applicant has almost 3 years of international research experience, has presented his work in over 20 national or international congresses and seminars and has already received numerous awards and fellowships. He is also an active referee for peer-reviewed journals and has co-supervised graduate students.

**Resumen del Currículum Vitae:**

Dr. Mauro Mato studied Chemistry at the University of A Coruña (2016, Extraordinary Award) and got a Master's Degree in Chemistry at the Rovira i Virgili University (2017, Extraordinary Award). Then, he conducted his PhD studies at ICIQ (Tarragona, Spain) under the supervision of Prof. Antonio M. Echavarren, graduating in July 2021 (cum laude, Extraordinary Award). During his PhD studies, he worked on streamlining the generation of metal carbenes, applying aromative decarbenations in the development of new synthetic methodology. His work at ICIQ resulted in the publication of 13 articles (most of them as first author) and on several awards. To list some, he obtained the Lilly–RSEQ Award for PhD Students (2020), the Alfred R. Bader Award by Merck (2021) and the Josep Castells Award by the RSEQ (2022).

He also carried out a research stay in 2019 at Scripps Research (San Diego, CA, USA) under the supervision of Prof. Phil S. Baran. He worked on the development of a new bioconjugation platform in collaboration with the biotechnology company Vividion Therapeutics.

In October 2021, the applicant started his postdoctoral work under the supervision of Dr. Josep Cornella, at the Max-Planck-Institut für Kohlenforschung in Mulheim an der Ruhr (Germany). In 2022, he obtained a Marie Sklodowska-Curie Postdoctoral Fellowship to develop his own ideas pioneering the field of bismuth redox catalysis. His work laid foundations for new research lines on the areas of bismuth radical catalysis and the photochemistry of low valent-bismuth complexes.

After this period, in June 2024, the applicant will continue to develop his independent career at CiQUS (University of Santiago de Compostela, Spain) in collaboration with Prof. José Luis Mascareñas, merging the fields of metal photocatalysis and bioorthogonal chemistry.

At the current stage of the applicant's academic career (only 2.5 years after PhD defense), he has already coauthored 18 publications (14 of them as main author) in high impact journals (e.g.: Nat. Chem., J. Am. Chem. Soc., Angew. Chem. Int. Ed.), with 3 more currently in preparation. He has received over 550 citations (h-index of 13) and has presented his work in more than 20 national or international congresses and symposiums.

The applicant has co-supervised graduate students throughout his career, including Arnau R. Sugranyes (ICIQ, 2020–2021), Davide Spinnato (MPI KoFo, 2021), and Fumiya Takahashi (MPI KoFo, 2022). In all cases, these collaborative efforts resulted in publications including the work accomplished by the mentored students.

He has experience in writing successful proposals to attract funding, and in managing the budget of such grants (e.g. MSCA). He has ample experience drafting, submitting, and revising scientific articles. The applicant is an active referee for peer-reviewed scientific journals. He was among the top 10% of reviewers for Angewandte Chemie in 2022. The applicant has ample international research experience (ca. 3 years), exposing himself to a variety of research environments across the world.

He has also worked on a wide range of fields within organic chemistry, such as metal catalysis, organic synthesis, organotransition-metal chemistry, main-group chemistry, radical reactivity, photochemistry, bioconjugation and both theoretical (DFT) or experimental physical-organic chemistry.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | MORZAN MORZAN, URIEL NICOLAS |
| **Referencia:** | RYC2023-044648-I |
| **Correo Electrónico:** | umorzan@gmail.com |
| **Título:** | Towards Light-Driven Biomolecular Function |

**Resumen de la Memoria:**

I am a computational chemist working at interfase between advanced method developments and cutting-edge applications in chemistry, physics and biology. My publication track-record illustrates the diversity of my research interests, which include molecular dynamics, quantum chemistry, molecular biophysics, data-driven methodologies, and high-performance software development. It also underscores my numerous international collaborations with experimentalists and theoreticians in the broad fields of chemistry, biology, and physics. I have authored 25 peer review articles, including 3 Nat. Commun, 1 Sci. Adv., 2 PNAS, 1 PNAS nexus, 2 JACS, 2 Angew. Chem. and 1 Chem. Rev. I am first author in 8 articles and corresponding author in 6, with a total of 832 citations and an h-index of 15 (Source: Google Scholar). I participated in 8 research projects (including two NIH projects in the USA, and 2 European projects) and I recently applied to an ERC starting grant (awaiting results).

My research will be devoted to uncovering fundamental principles that determine light-induced biomolecular function. The extraordinary light-harnessing efficiency of biomolecules is largely due to nature's ability to finely tune light absorption and electronic degeneracies in the biomolecular energy landscape known as conical intersections (CoIns). The secret resides in the exceptionally rich structural variability of biomolecules. Supramolecular motifs can precisely regulate light absorption and CoIn properties and thus enable a broad repertoire of optical responses, ranging from light-emission, to heat-dissipation, or photochemical reactivity. Current physicochemical understanding of such biomolecule-photon interactions is based on a chromophore-environment paradigm, where the research effort is focused on the chromophore, often regarding its surroundings as a secondary factor. However, recent evidence shows that optical activity can directly emerge from cooperative supramolecular interactions. Because of our limited conceptual framework many fundamental aspects of biomolecular light-response have been neglected.

During the grant period, I will set the foundations for a paradigm-change in the study of light-induced bioactivity where the full complexity of the supramolecular modulation can naturally emerge from excited-state simulations. By combining state-of-the-art non-adiabatic dynamics simulations with very recent data-oriented techniques and information-theoretical approaches, I will identify general biomolecular motifs that enable regulation of CoIn shape and accessibility as well as the ensuing light-driven response. This project will expand our chemical intuition beyond the chromophore-environment perspective, bringing supramolecular dynamics to the forefront of our research, and discovering general biomolecular design rules behind photophysical and photochemical modulation.

My wide background and my experience leading pioneering contributions in the field, together with my interdisciplinary network of collaborations with experimentalists and theoreticians in the broad fields of physics, chemistry and biology, put me in a unique position to lead the exciting challenges posed by this project.

**Resumen del Currículum Vitae:**

EDUCATION:
2012 - Degree in Chemistry - University of Buenos Aires (UBA), Argentina
2017 - PhD in Chemistry - UBA, Argentina

CURRENT POSITION:
Since November 2023 - Assistant Researcher, Physics Department, UBA, Argentina.

PREVIOUS POSITIONS:
2022 - 2023   Senior Research Fellow, The International Centre for Theoretical Physics (ICTP), Italy.
2019 - 2022   Postdoctoral Fellow. ICTP, Italy
2017 - 2019   Postdoctoral Associate, Yale University, USA

FELLOWSHIPS & AWARDS
2022 - now        Senior Research Fellowship, ICTP (Italy).
2021      Best contributed talk. ICTP (Italy).
2019       Postdoctoral Fellowship, ICTP (Italy).
2013      Carl Storm International Diversity (CSID) Fellowship. Gordon Research Seminar and Gordon Research Conference on Time Dependent Density Functional Theory.
2013      Best work in Theoretical and Computational Chemistry. Argentine Council of Physical Chemistry Research.
2012-2017        PhD fellowship awarded by the National Scientific and Technical Research Council, Argentina
2011      Undergraduate research fellowship. University of Buenos Aires.
2010      IAESTE Scholarship. Queen's University Belfast. School of Mathematics and Physics.

ACADEMIC OUTPUT
I have authored 25 peer-reviewed articles, including 3 Nat. Commun, 1 Sci. Adv., 2 PNAS, 1 PNAS nexus, 2 JACS, 2 Angew. Chem. and 1 Chem. Rev. I am first author in 8 articles and corresponding author in 6, with a total of 847 citations and an h-index of 15 (Source: Google Scholar).

SUPERVISION & TRAINING
I supervised 3 PhD students during their visits at ICTP.  At Yale, I mentored 2 PhD and 1 undergraduate student. I also participated in a thesis committee (UBA, 2018).

RESEARCH PROJECTS
I participated in 8 research projects (including 2 NIH project in the USA, and 2 European projects) and I recently applied to an ERC starting grant (awaiting results).

SOFTWARE DEVELOPMENT
I am a developer of to the LiO  project, a free and open-source GPU-accelerated electronic structure software .

CONFERENCE ORGANIZATION
In 2022 and 2023 I led the organization of two international conferences held at ICTP.

KNOWLEDGE DISSEMINATION
-In recent years, I have delivered 11 invited seminars and 4 contributed talks (8 of them outside Italy).
-I also participated in 9 public presentations in Computational Chemistry oriented to high-school students.

TEACHING
- I was invited lecturer in 5 International Schools held in Argentina and one in Rwanda.
- In 2008-2017 I was teaching assistant in Physical Chemistry at UBA.
- In 2017-2019 I gave numerous lectures for postgraduate courses in Quantum Chemistry and Statistical Mechanics at Yale.
- In 2020-2023 I was in charge of the Numerical Methods course of ICTP' s diploma program.

INSTITUTIONAL RESPONSIBILITIES
2021-2022      Postdoc Representative. Postdoc commission of ICTP (Italy).
2023        Scientific proposal review panel. National Research, Development and Innovation Office of Hungary.
2017-now  Referee for  several top journals in my field.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | MORENO CRUZ, CARLOS |
| **Referencia:** | RYC2023-044652-I |
| **Correo Electrónico:** | cmorenoc90@gmail.com |
| **Título:** | Carbon-based architectures for improved optoelectronic applications |

**Resumen de la Memoria:**

During my PhD studies, I focused my research on the preparation of distorted nanographenes containing seven-membered rings and helical chirality. My research was of great impact in the scientific community, being the first study of the synthesis and evaluation of the chiroptical properties in curved nanographenes. The experimental and theoretical study of the Circular Dichroism and Circularly Polarized Luminescence in these systems represented a leap forward in the field of nanographenes. I also participated in collaborative works with national and international researchers, studying, specially in the development of photoluminescent inorganic complexes. During my postdoctoral stage at the University of Zurich, my research was focused on the preparation of Phenalenyl-based arrays and their theoretical study by Density Functional methods. I centered my research in the study of the phenalenyl dimerization product, Peropyrene. Selected as a promising scaffold for Singlet-Fission processes, I carried out synthetic and theoretical investigations over this promising scaffold. During my second postdoctoral stage, I focused my attention in helical systems and the theoretical study of their chiroptical properties. Combining artificial intelligence and synthetic chemistry, we are understanding the relationship between the area of helical compounds and their chiroptical response. In this last stage I also started my independent research line, focused in an unexplored carbon-based building block. The investigations over the selected building block will represent an unexplored field in my previous research lines, however, I will study not only their chiroptical properties, but also evaluate them as potential Aggregated Induced Emission (AIE) luminogens. Additionally, I aim to expand my research into, to me, unexplored fields, such the single molecule conductance (creating molecular wires), the study of supramolecular assemblies and the preparation of donor-acceptor molecular materials with application in solar cells. The expected outputs from the synthesis and study of such singular scaffold aim to fill existing gaps in different fields. The impact of this research line is remarkable and will be of high interest for chemists, physicists, and material scientists. The research line has a marked multi- and interdisciplinary character, nevertheless, it is founded over synthetic organic chemistry.

**Resumen del Currículum Vitae:**

I received the BSc in Chemistry in 2014 and a MSc degree in Biotechnology. In 2020, I defended my PhD thesis under the supervision of Prof. A. G. Campaña and Prof. J. M. Cuerva as FPI Fellow (Summa Cum Laude and Extraordinary Doctorate Prize). During my PhD studies, I coauthored several research articles, focusing on the preparation of distorted nanographenes containing seven-membered rings and helical chirality. My research was of great impact in the scientific community, being the first study of the synthesis and evaluation of the chiroptical properties in curved nanographenes, and awarded as runner-up at the Best Thesis Awards by the GENAM (RSEQ). Additionally, I participated in numerous national and international congresses, sharing my results as oral contributions and posters, where I was awarded twice for the Best Poster Presentation. I carried out a three-months predoctoral stay at the University of Zurich (UZH), supervised by Prof. M. Juríček. This internship led me to work on diradicaloid systems based on polycyclic aromatic hydrocarbons, understanding the marriage between open-shell systems and helicenes. I carried out a visit to the laboratories of Prof. E. Maçôas at the IST of Lisbon, where I got hands-on training in the measurement and theory of the two-photon absorption technique. Dissemination of my research focused an important part of my PhD, I participated in three editions of the European Researcher' s Night, contributing with oral and hands-on experiments, triggering scientific curiosity among society. Shortly before finishing my PhD studies, I applied for the Spark Grants of the Swiss National Science Foundation to open a new research line at Juríček Group (UZH). My proposal was funded and allowed me to supervise my first project as PI, working on the preparation of carbon-based molecules with appealing topologies. During my postdoctoral stage at the UZH, I also received funding from the Forschungskredit frame, to develop a project based on the preparation of phenalenyl arrays. At the Juríček Group, we envisioned two studies on the synthesis and singlet-fission properties in bent pyrenacenes, which I published sharing correspondence. In addition, I gained a deep knowledge in organic radicals, their synthesis, characterization by EPR and their theoretical study. Additionally, I participated in dissemination activities, such as the Science Info Day 2022 and the Science and Nature Festival 2022, showing our lab and research to families, and in communication activities such as the OPiEM Meetings, where I received a Best Presentation Award. I continued looking for teaching activities, participating in the RISE WorldWide program as host for a German undergraduate student, and supervising three BSc theses. In the summer of 2022, I joined the MOReFUN research group as a Junta de Andalucía Postdoctoral Fellow. In 2023, I started a new research line with a project funded under the Proyectos de Generación de Conocimiento 2022 frame. I also received funding from the UGR, in the Proyectos de Investigación Precompetitivos para Jóvenes Investigadores call. I am also supervising a PhD student and I have supervised three BSc and three MSc students. I continued collaborating with national and international colleagues in different fields such as polycyclic aromatic hydrocarbons, organic radicals, and inorganic complexes.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | FUENZALIDA WERNER, JUAN PABLO |
| **Referencia:** | RYC2023-042520-I |
| **Correo Electrónico:** | jpfuenzalidaw@gmail.com |
| **Título:** | Protein engineering and design for sustainable materials |

**Resumen de la Memoria:**

Polymers and colorant components of today's materials still originate from the oil field, the strip mine, or the slaughterhouse. As an answer, I aim to develop protein polymers and colorants as sustainable alternatives by integrating protein engineering and synthetic biology with physical chemistry and materials science.

\*\*\*Technical University of Munich, Group Leader, Since 2020.

Since September 2020, I have led the "Optoelectronics Protein Development" group at the Technical University of Munich, focusing on protein engineering in materials science and therapeutics. My team and I have produced significant research, including published articles in top-tier journals. I manage administrative and biosafety responsibilities for the campus. I've secured a €46,000 Seed Fund in addition to my Marie Curie Fellowship project. Our work has led to breakthroughs in protein engineering for material science, with two patents in progress, ten publications, and three as corresponding authors in Advanced Materials, ACS Nano, and Advanced Functional Materials.

\*\*\*Helmholz zentrum München, Senior Postdoc, 2016-2020.

I focused on developing new genetically encoded labels and optoacoustic instrumentation under the German "Sorting Sounds" project. I specialized in protein development and structural analysis for advanced imaging techniques. Mentoring already one Ph.D. student, we published significant findings, including a novel calcium sensor for super-resolution microscopy and photoacoustic imaging in Nature Biotechnology. I also highlight our work on engineered phycobiliproteins for optoacoustic imaging, creating a high-resolution optoacoustic spectrophotometer, and living material. My interdisciplinary skills culminated in a patent for imaging in the short-wave infrared range. As part of the research group, I continued as a protein and spectroscopy specialist in two German National Projects

\*\*\*Phd Studies, University of Münster, 2011-2015.

I co-supervised several bachelor's and master's theses, and participated in professional training sessions. I completed doctoral stays and published research at the University of Hyderabad, John Hopkins University, and the University of Claude Bernard. I focused on forming colloidal complexes between polysaccharides and proteins, resulting in seven articles and two proceedings. I gained expertise in material science, thermodynamics, spectroscopy, and SAXS. My work on alginate and lysozyme interactions, published in Food Hydrocolloids, was a key achievement.

\*\*\*Teaching activities

2020    Instrumental Analytics (BSc), Protein-based materials (MSc), Advance Spectroscopy(MSc), Physical Chemistry in nature (BSc). Technical University of Munich, Germany

2015    Invited Professor, Atomic, and Molecular Structure, Data Analysis, University of Navarra, Spain

\*\*\*2011  Diploma Pharmaceutical Chemist (Two articles), Universidad Austral de Chile, Chile.

\*\*\* Fellowships and awards

2020    TUM Seed Fund (46,000 Eur.)

2020    Marie Sklodowska-Curie Individual Fellowships, Chair of Biogenic Functional Materials, IMDEA Materials, Spain.

2011-2014    Ph.D. International scholarship- Molecular and Cellular Glycoscience (IRTG-MCGS) at the University of Münster

2005 – 2011    Beca Bicentenario, Chilean government fellowship for outstanding students.

2005 – 2011    Beca Fundación DAEL.

**Resumen del Currículum Vitae:**

I am a 36-year-old Chilean protein engineer with experience in spectroscopy and polysaccharide-based materials, leading a team in optoelectronics protein development at the Technical University of Munich. My career spans five countries and three continents, with 32 articles, an H-Index of 17, two patents, and over 750 citations. Key achievements include publishing on fluorescent proteins in Nature Biotechnology, making proteins compatible with organic solvents in Advanced Materials, and modifying proteins and enzymes for biomedical and material science applications in journals like ACS Nano, Food Hydrocolloids, ACS Chemical Biology, Advanced Functional Materials, etc.

I enjoy manipulating protein functions and colors and using protein engineering and synthetic biology; I aim to establish a research line in protein-based materials for sustainable textiles, data storage, and encoding applications.

As the "Optoelectronics Protein Development" group leader at the Technical University of Munich, I've set up advanced laboratories and mentored Ph.D. students, contributing to significant publications and patents. I manage one technician and have been recognized with a Marie Curie Individual Fellowship and a seed grant of 46k. All the students under my official mentoring since 2021 have already articles in Q1 journals accepted or under evaluation. During my senior postdoc period at the Helmholzentrum münchen, I also was a protein and spectroscopy specialist in two German national projects.

I have collaborated on projects like ARTIBLED, HyNanoSC, and AnBioLED, and led a new line in photoacoustic spectroscopy at Helmholtz Zentrum München. I evaluate research projects for the Community of Madrid and review for journals like Cancer Nanotechnology and Food Hydrocolloids.

I've contributed to the Nature Portfolio Bioengineering Community and TV, and actively use social media to share my scientific work, reaching a significant audience. My work has led to invitations as a speaker at global universities in Japan, Switzerland, and Spain, among others.

Lastly, my teaching experience includes 700 hours at the master's and bachelor's level.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | ALVAREZ ALVAREZ, MARIA SALOME |
| **Referencia:** | RYC2023-044722-I |
| **Correo Electrónico:** | msaa@uvigo.es |
| **Título:** | Promoting the use of eutectic mixtures for advancing the circular economy of water and addressing emerging contaminants. |

**Resumen de la Memoria:**

The applicant earned the doctoral degree in 2015 and has since undertaken various roles in both the scientific and teaching domains. The international research experiences include a predoctoral stay at the Institute of Chemical and Biological Technology in Portugal and an extensive postdoctoral stay at the Henry H. Hoyt Laboratory in the Chemical and Biological Engineering Department at Princeton University (USA). During her time at Princeton, the applicant collaborated on an international project with the TECHNION Institute in Israel and participated as a member of the international project titled "International training and education in advanced technologies." Additionally, the applicant serves as a continuous evaluator for FONCyT Argentina and is a member of the editorial board for several journals. In the section on independence and leadership, the candidate highlights her role as the principal investigator in the project titled "Application of new design solvents for the more sustainable production of biofuels" (€25,000), supporting grants for the post-doctoral training stage.

The research proposed is focused around the principles of the circular economy of water. The primary focus is on recovering, reusing, and recycling water as key strategies to reduce freshwater consumption in non-essential sectors of society. The central objective is directed towards wastewater effluents, supported by the applicant's demonstrated expertise in developing biocompatible platforms for contaminant extraction or valuable chemical recovery. This involves the use of environmentally friendly techniques, such as aqueous biphasic systems, with a specific emphasis on remediating diverse pollutants, including emerging contaminants. In contrast to the applicant's previous research, the current line emphasizes the synthesis of surfactant deep eutectic mixtures (SDEM) to enhance the bioavailability of hydrophobic emerging contaminants (EPs), such as drugs. This aims to propose sustainable and efficient industrial processes. Notably, there is limited information on deep eutectic solvents (DES) synthesized using surfactants, highlighting the contemporaneity and relevance of the present research direction.

The project within this research line explores the triple role of SDEM as solubilizers for EPs, enhancers of bioremediation, and coadjuvants in treating aqueous wastewater effluents. This project lays the groundwork for treating more complex effluents from sources like hospital complexes, offering a biotechnological and sustainable solution with a reduced environmental footprint. Simultaneously, this research initiative has the potential to contribute essential knowledge for implementing sustainable industrial processes and extending the life cycle of treated water, allowing for its reuse in various applications, aligning with the objectives outlined in the UN 2030 Agenda.

**Resumen del Currículum Vitae:**

In terms of scientific contributions, the applicant has a total of 45 published articles and has actively participated in various national and international conferences, with a notable emphasis on plenary and invited talks in recent years.

Within the realm of teaching, the candidate has co-supervised a doctoral thesis and is presently overseeing two additional doctoral theses. Additionally, the applicant has co-supervised of several final master's projects and end-of-degree projects. Moreover, the candidate has been involved in teaching activities at the University of Vigo since 2018, covering various subjects. The applicant holds the I3 certificate from the AEI and accreditations from ANECA as a contracted professor, private university professor, or assistant professor. Furthermore, the candidate is a member of the teaching innovation group in chemical industry processes, petrochemistry, and biotechnology at the University of Vigo (IN-PROQUIBIO, 2020-present).

It is noteworthy to highlight the applicant's participation in scientific outreach programs such as the International Day of Women and Girls in Science, the STEMbach program promoted by the University of Vigo, and invitations to deliver talks on scientific dissemination as part of the "thesis advances seminar" in Mexico. The applicant has been an active reviewer of scientific articles since 2016, serving as a special issue editor for Catalysts and a review editor for Molecular Liquids at Frontiers in Chemistry. Additionally, the candidate is a member of various scientific, technical, and organizing committees.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | ALLER PELLITERO, MIGUEL |
| **Referencia:** | RYC2023-043347-I |
| **Correo Electrónico:** | miguelyaller@gmail.com |
| **Título:** | Electrochemical biosensors for health monitoring and personalized medicine |

**Resumen de la Memoria:**

My career has been focused on the development of electrochemical sensors for health monitoring applications, addressing challenges at the intersection of very different disciplines such as chemistry, pharmacology, biology, materials science, or electronic engineering. This multidisciplinary background has provided me with the necessary tools to understand and address key questions to develop innovative approaches for the design of chemical sensors and their preclinical and clinical application.

My research to date has encompassed the following areas:

-Fabrication of electrochemical devices. My doctoral research at the Centro Nacional de Microelectrónica (CSIC), under the mentoring of Prof. del Campo, focused on the development of miniaturized, self-powered electrochemical sensors for the non-invasive monitoring of biomarkers. My thesis followed a highly multidisciplinary approach combining work in micro/nanofabrication and rapid prototyping techniques, enzymatic biosensing, organic synthesis, electrochromism, and mathematical simulations, thus allowing me to achieve an in-depth knowledge of the fundamentals of electrochemical sensing.

-Electrochemical sensing for in vivo monitoring and clinical applications. Seeking to explore the translation and applicability of electrochemical sensors, I joined Dr. Arroyo's lab at the Johns Hopkins University (Baltimore, USA). My work there focused on: i) the real-time and continuous monitoring of therapeutic drugs directly in the body of live rodents using implantable, electrochemical aptamer-based sensors, and ii) the monitoring of COVID-19 patients using glucometer-based immunosensors.

-Selection of DNA aptamers for affinity-based biosensors. After working in the field of aptamer-based sensing and witnessing its potential to revolutionize electrochemical sensing, I decided to join Prof. Lobo-Castañón's lab at the University of Oviedo, one of the leading groups in the in vitro selection of aptamers. Supported by a Fundación Científica AECC fellowship, my work here has focused on the in vitro selection of aptamers to develop electrochemical, aptamer-based sensor for the monitoring of chemotherapy.

My goal as independent researcher is to unify my background in the different aspects of electrochemical sensing, namely selection of recognition element, design and fabrication of sensors, and preclinical/clinical application to develop electrochemical sensors that allow us to: (i) better understand the relationship between pharmacokinetics/pharmacodynamics and clinical outcomes of both new and well-known therapeutic drugs, (ii) create non-invasive and minimally invasive innovative tools for personalized monitoring of pharmacological treatments to improve their efficacy and minimize the occurrence of side-effects, and (iii) develop analytical platforms for the early diagnosis of diseases and their remote monitoring.

**Resumen del Currículum Vitae:**

I obtained my PhD in Chemistry working under the mentoring of Prof. del Campo at the Centro Nacional de Microelectrónica (CSIC) in Barcelona (2015-2019). During my PhD, I worked on 5 different projects, having close collaborations with institutions and companies. My work there led to the publication of 14 peer-reviews articles (7 of them as first author), 2 book chapters, and the granting of 2 patents.

After graduating, I joined Dr. Arroyo's lab at the prestigious Johns Hopkins University School of Medicine (Baltimore, USA), where I worked as a postdoctoral researcher for >3.5 years (2019-2022). During my tenure at Hopkins, I worked on 5 different projects, including a prestigious RO1-NIH project, and 1 contract, leading to the publication of 10 articles (7 as first author, 1 as corresponding author) and 1 book chapter, and the filing of 3 patents.

Last, supported by an AECC fellowship, I joined Prof. Lobo-Castañón's lab at the University of Oviedo, where I currently work. During this time, my work here has focused on trying to secure funding and establishing a solid network to develop my own research line in the field of chemical sensors for personalized medicine, also engaging in mentoring and teaching activities.

Throughout my career I have demonstrated the necessary skills to become an independent researcher:

-Independent thinking and scientific leadership. My career has taken a highly multidisciplinary approach including fields like electrochemistry, microfabrication and rapid prototyping, mathematical simulations, organic synthesis, in vivo monitoring, or clinical assays. This has allowed me to maintain a solid and constant level of productivity in various scientific areas leading to the publication of 26 articles in medium/high impact, peer-reviewed journals (16 as first author, 1 as corresponding) with 580 citations and an h-index of 15, 3 book chapters, and 5 patents.

-Collaborations. Developing my career at 3 different institutions has allowed me to establish a solid network of collaborators from Spain, USA, France, Italy, or the UK, as well as R&D companies. This is demonstrated by the various multi-institutional articles published (>60% of my publishing record).

-Funding. I have secured funding from highly competitive calls that include the Beatriu de Pinós (144.000 €) and Fundación Científica AECC (160.000 €) programs.

-Mentoring and management. During my career, I have actively participated in mentoring and teaching activities. I have co-mentored 11 BSc., MSc., and PhD students in the 3 different institutions that I have worked at, and I have taught different classes in Chemistry, Biotechnology, and Chemical Engineering programs.

-Outreach. I have participated in outreach events such as "ESCOLAB", "Week of Science", "Research Immersion Days", and "Orientation Days".

-Organizational activities. I have co-organized 1 symposium at the 2021 ACS Fall National Meeting (Atlanta, USA) and 1 workshop at the 2022 ACS MARM Meeting (Trenton, USA).

-Editorial activities. I have served as Guest Editor for 5 special issues and regularly serve as reviewer for journals like Angewandte Chemie, ACS Sensors, ACS Measurement Science, or ChemElectroChem, among others.

-Evaluation committees: international evaluator of doctoral thesis (UAB, 2021), committee member (University of Oviedo, 2023), committee member (BCMaterials, 2024).

**Resumen de la Memoria:**

I aim at the characterization of the photochemistry of nitroaromatic compounds, the DNA photostability/photodamage, the photophysics of ionic transition-metal complexes, and the chemiluminescence of luminol.

My main scientific contributions are: first time characterization of the photochemical process leading to NO in 1-nitronaphthalene, proving the involvement of triplet states; global characterization of the mechanisms of formation of NO in nitrobenzene, critically evaluating the importance of a roaming mechanism thought the formulation of a theoretical model able to reproduce the bimodal distribution of the NO translational energy at the basis of the experimental evidence of two different mechanisms of formation; proposal of a new paradigm-shifting photoinduced mechanism of formation of the 6-4TT DNA photodamage, showing how the excitation of a single nucleobase can indeed start the photoreaction; characterization of the topology of the CASPT2 conical intersections leading to the CTD and 6-4TT DNA photodamages and how it is affecting their quantum yield of formation; paradigm-shifting demonstration of the importance of ligand-centered states for increasing the emission efficiency of ionic transition-metal complexes; first time characterization of the conical intersections leading to the chemiexcitation of luminol, posing the basis on how to increase its efficiency by chemical substitutions; design of interfaces between the open-source OpenMolcas and Cobramm codes and OpenMolcas and Quantics programs so to compute two-dimensional electronic spectra and performing DD-vMCG quantum dynamics, respectively.

**Resumen del Currículum Vitae:**

I presented my results in 44 publications: 36 papers in international peer review journals, 6 book chapters, 1 cover feature, and 1 article in a national journal. I presented my results in international congresses as 4 invited talks, 11 oral contributions and 17 posters. I also participate in dissemination activities as the European researcher's night and the IcMol ExpoCiencia open-doors day.

I secured the next grants: 4-years pre-doctoral grant "V Segles" of Universitat de València; 2-years "Intra European Marie Curie (MSCA-IF)" fellowship; 1-year post-doctoral grant "Atracció de talent" of Universitat de València; 3 years post-doctoral grant "Juan de la Cierva Incorporación".

I acquired a deep expertise in the characterization of singlet and triplet potential energy surfaces (optimizing minimum-energy paths, minima, conical intersections, transition states, singlet-triplet crossing regions) on isolated organic molecules using the ab-initio methods CASSCF, RASSCF, CASPT2, RASPT2 implemented in OpenMolcas. I acquired competence for performing such a study also on ionic transition-metal complexes using DFT/TDDFT with the Gaussian and Orca, and doing QM/MM calculations with Cobramm. I acquired a high expertise performing DD-vMCG dynamics in Quantics.

I was the PI of one European (C.3.4) and one national project (C.3.1) and the person in charge of a specific task of the work in one European (C.3.6) one national (C.3.2) one regional project of excellence (C.3.3) and one regional (C.3.5) project. I established international collaborations with: Dr Garavelli (12 shared articles); Dr Mukamel (8 shared articles); Dr Worth (5 shared articles); Dr. Borin (1 shared article); Dr Lindh (5 shared articles); Dr Rivalta (8 shared articles); Dr Dumont (2 shared articles); Dr Monari (1 shared article); Dr Marazzi (1 shared article).

I trained young researchers as the supervisor of 2 end-of-bachelor projects (TFGs), the co-supervisor of 4 TFGs, and the co-supervisor of 4 end-of-master projects (TFMs). I am currently the co-supervisor of 1 TFG, 1 TFMs, and one PhD. The PhD, Soriano-Díaz, was my former TFG student, and our work resulted in a publication in the Inorganic Chemistry journal (C.1.2) and in an oral presentation in an international congress. In 2022 we secured a regional pre-doctoral grant proposing a project on the photophysics of ionic transition-metal complexes (CIACIF/2021/438).

I worked in leading Institutions, as UCL and the Maria de Maetzu IcMol.

I have been teaching in the Degree of Chemistry (19 ECTS) and of Pharmacy (18 ECTS) of the Universitat de València. I have been teaching, being for two years the coordinator, the "Theoretical chemistry methods I" course of the "Erasmus Mundus European Master in Theoretical Chemistry and Computational Modelling" (4 ECTS).

My independence and leadership are reflected in my publications, being the first author in 16 articles, sharing the correspondence authorship in 9 articles, and being the only corresponding author in 6 articles. Among the latter, I have an article in Journal of Chemical Theory and Computation as the only author. I also have 23 articles without my PhD supervisors.

I am a reviewer of J. Am. Chem. Soc., Phys. Chem. Chem. Phys., Chem. Comm., Chem. Eur. J., ChemPhysChem, Comput. Theor. Chem, Theor. Chem. Acc., and Polyhedron.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | BORLAF PINAR, MARIO |
| **Referencia:** | RYC2023-044679-I |
| **Correo Electrónico:** | mario.borlaf@uam.es |
| **Título:** | Síntesis, caracterización, procesamiento coloidal y fabricación aditiva de materiales cerámicos |

**Resumen de la Memoria:**

Dr. Borlaf has experienced a great formation in the research field during 14+ years thanks to the supervision of very well-known researchers in the world of ceramics.

The research knowledge of the applicant started at Instituto de Cerámica y Vidrio (ICV-CSIC, Spain) with the synthesis of nanoparticles for photoinduced applications by colloidal sol-gel method. Later, during his first postdoc position at Universidade Federal de Santa Catarina (UFSC, Brazil), he continued with this line, but during his second postdoc position at Swiss Federal Laboratories for Materials Science and Technology (Empa, Switzerland), he got the knowledge of Flame Spray Synthesis (FSS). Thanks to that, Dr. Borlaf could collaborate with Paul Scherrer Institute (PSI, Switzerland), publishing one of his most cited articles. He also worked in the colloidal processing of ceramic materials for additive manufacturing techniques such as Selective Laser Sintering/Melting (SLS/SLM) and Stereolithography-based (SLA) techniques. In this field one can find his second publication with the highest number of citations. In a third postdoctoral stage at Universidad de Burgos (UBU, Spain), he applied his knowledge in colloidal processing and additive manufacturing for the development of a new disruptive device: the 3D printed injectable battery. Currently, he is Associate Professor at Universidad Autónoma de Madrid (UAM, Spain), where he aims to implement his own research line based on the synthesis, colloidal processing, and additive manufacturing of ceramics. Dr. Borlaf is co-author of 44 articles (41 in journals included in SCI) and 1 book chapter. He is the first author in 20 articles and the corresponding author in 12. He is co-author of 40 works presented in international (31) and national (9) conferences. He participated in the organisation of 4 courses and 1 international congress, as reviewer in different scientific journals and PhD symposia, and as project manager. Furthermore, his commitment with the formation of new researchers is demonstrated because he directly supervised 3 undergraduate, 4 MSc and 2 PhD students. He has been the PI in 3 projects, receiving a total funding of 200560,56 € Finally, he is also a member of "Sociedad Española de Cerámica y Vidrio (SECV)" and "Sociedad Española de Materiales (SOCIEMAT)".

**Resumen del Currículum Vitae:**

Mario Borlaf obtained his degree in Chemistry by Universidad Autónoma de Madrid (UAM) in 2009 (Madrid, Spain). After that, he initiated his research career at Instituto de Cerámica y Vidrio (ICV-CSIC) as PhD student, receiving his PhD degree in 2013 by UAM (Madrid, Spain). The work developed for four years led to publish a total of 10 full-length articles, 2 SCI-conference articles, 2 non-SCI-conference articles and 1 book chapter. 2 of those 10 full-length articles were the product of the work of 2 short stays of three months each, approximately, at the following institutions: National Chung Hsing University (Taichung, Taiwan, 2011) and University of Liège (Liège, Belgium, 2012). During his PhD, Dr. Borlaf also co-supervised one undergraduate student in 2010 and his work allowed publishing one full-length article.

In 2014 he got a Postdoctoral position at Universidade Federal de Santa Catarina (UFSC) in Florianópolis (Brazil). At this position, Dr. Borlaf started to work as an independent researcher and to co-supervise 2 PhD students. A total of 6 full-length articles were published.

In 2015 Dr. Borlaf started to work at Empa (Dübendorf, Switzerland) as Postdoctoral Scientist in the Laboratory for High Performance Ceramics. In 2018, his contract was modified, acquiring a higher status: Scientist. During this stage, Dr. Borlaf acquired a high maturity as an independent researcher (publishing a total of 19 articles) and as supervisor (of 4 MSc and 2 undergraduate students). He also acted as project manager of 2 projects, one of them with industry partners.

Between 2020 and 2022, he was as Postdoctoral Researcher at Universidad de Burgos (UBU, Burgos, Spain). He used his knowledge in colloidal processing and additive manufacturing for the development of injectable batteries, publishing his work in 2 full-length articles and 1 letter. He also participated in 2 projects as PI, receiving a total funding of 171966 €

Currently, he is working at UAM since September 2022 as Assistant Professor. He is the PI of a knowledge transfer project with a company, receiving a total funding of 28594,56 € through an "art. 83" agreement. He already accumulated a total of 323 teaching hours.

In summary, Dr. Borlaf has 14+ years of research experience on synthesis, processing, and application of ceramic materials, which has led to co-authoring 41 articles in journals included in SCI (10 Open Access, being 1 a Review article) and 1 book chapter. He is the first author in 20 articles and the corresponding author in 12. In addition to the publications, Dr. Borlaf has disseminated his work at different conferences and workshops. He is co-author of 40 works presented in 31 international and 9 national conferences, 1 in a workshop and 1 in a seminar. He also has been in 1 conference as invited speaker. He has participated in a total of 10 projects: 3 at ICV-CSIC, 1 at UFSC, 2 at Empa, 4 at UBU and 1 at UAM. Moreover, he has been the PI in 3 projects, receiving a total funding of 200560,56 €

Finally, he participated in the organisation of 4 courses and 1 international congress, and as reviewer in different journals and PhD symposia. Dr. Borlaf is also a member of the Spanish Ceramic Society (Sociedad española de Cerámica y Vidrio, SECV) and the Spanish Materials Society (Sociedad Española de Materiales, SOCIEMAT).

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | DE PAIVA , RAPHAEL |
| **Referencia:** | RYC2023-045002-I |
| **Correo Electrónico:** | raphael.depaiva@dipc.org |
| **Título:** | Gold-Catalyzed Innovation: A Journey through Bioinorganic Chemistry and Chemical Biology |

**Resumen de la Memoria:**

My academic journey started at a top Chemistry Institute in Latin America, with my undergraduate, master's, and Ph.D. degrees at the University of Campinas (UNICAMP). During my Ph.D., a secondment in the USA under Dr. Nicholas Farrell triggered my interest in gold chemistry, leading to impactful research and a long-term collaboration with his group. A project at the Brazilian Synchrotron Light Source (LNLS) allowed me to collaborate with and learn from Dr. Frederico Lima, a synchrotron light specialist (currently at the European XFel). Subsequently I had a postdoctoral fellowship at the University of São Paulo.

After obtaining my PhD degree, I had the opportunity to live in and work at top research institutes in Australia, Ireland, and now in Spain for my current "la Caixa" Junior Leader position. Work at Griffith University's Institute for Glycomics in Australia exposed me to Metalloglycomics, particularly the interaction of cobalt complexes with glycosaminoglycans. The subsequent IRC fellowship in Ireland provided opportunities to explore platinum compounds hybridized with oligonucleotides and investigate the mechanism of action of polynuclear platinum compounds.

My current position at the Donostia International Physics Center (DIPC) in Spain, funded by the "la Caixa" Junior Leader fellowship, allowed me to establish and lead my own independent research group. Actively engaging in collaborations, hosting international students, and organizing scientific events underline my commitment to fostering a cooperative and diverse research environment.

Some of my leadership accomplishments include three highly competitive fellowships, such as my current "la Caixa" Junior Leader Fellowship. As the leader of my research group, responsibilities encompass project conceptualization, management, and decision-making. To date, I have published 8 papers as corresponding author, including our latest contribution to Chemistry a European Journal. Touching on translational research initiatives, I have also led a cross-disciplinary team through the ASTRo program (by Roche), which we won with a metallodrug-based technology.

For my RyC fellowship, my group will contribute to two main areas within the medicinal inorganic chemistry field. The first involves exploiting the Se biochemistry and ferroptotic cell death via gold-based chemical tools. Leveraging the reactivity of cyclometallated gold(III) compounds, my goal is to achieve selectivity towards selenium in complex biological media, potentially paving the way for innovative pro-ferroptotic drugs targeting GPx4. The second area revolves around Metalloglycomics, an underexplored strategy for designing antiviral and antitumoral metallodrugs. My aim is to specifically targeting carbohydrates like heparin and heparan sulfate with bis cyclometallated gold(III) compounds, with potential applications in skin cancer therapies and antivirals.

In essence, my journey is marked by academic excellence, international collaboration, leadership, and a commitment to advancing the frontiers of bioinorganic chemistry. The diverse experiences and research directions outlined here reflect my dedication to making meaningful contributions addressing important challenges in the field. The RyC fellowship will be instrumental to further consolidation my research group within the Spanish science and innovation framework.

**Resumen del Currículum Vitae:**

Part A. PERSONAL INFORMATION

I am Raphael de Paiva, born on 09/12/1989, currently holding the position of "la Caixa" Junior Leader at the Donostia International Physics Center in Spain. My expertise lies in selenium arylation, gold chemistry, and bioinorganic chemistry.

A.2. Previous Positions

I secured an IRC Research Fellowship, which allowed me to join Dublin City University, Ireland, from 10-2021 to 09-2022. Prior to that, I was a FAPESP Postdoctoral Fellow at the University of São Paulo, Brazil, and a Visiting Research Fellow at Griffith University, Australia, exploring metalloglycomics.

A.3. Education

I earned my PhD in Science (Chemistry) from the University of Campinas, Brazil, with a one-year exchange at Virginia Commonwealth University, USA. My research focused on gold(I,III) complexes targeting zinc finger proteins. I also hold an MSc in Chemistry and a BSc in Chemistry, both from the University of Campinas.

Part B. CV SUMMARY

As a "la Caixa" Junior Leader, I lead a group at the Donostia International Physics Center, focusing on designing gold complexes for protein modification under biocompatible conditions. My research journey includes collaborations with renowned researchers globally.

1. With Nicholas Farrell, I developed gold-based zinc finger inhibitors with tunable selectivity for Cys or His residues, demonstrating anti-leukemia and anti-HIV-1 activity.

2. Collaborating with Sue Berners-Price, I explored Metalloglycomics, revealing Werner' s hexol's biological properties, expanding cobalt compounds' applications in biology.

3. With Andrew Kellett, I developed platinum compounds for antisense anticancer and antiviral therapies, funded by the Irish Research Council.

My accomplishments include 44 papers, 926 citations, a book, and a filed patent. My PhD thesis received the Springer Theses award.

C. RELEVANT MERITS

Funded projects, nominal to me.

"la Caixa" Foundation (ID 100010434) Fellowship LCF/BQ/PI22/11910033, Donostia International Physics Center, (2022-current). EUR 305,410.00

IRC Research Fellowship, Irish Research Council (GOIPD/2021/909), School of Chemical Sciences, Dublin City University (DCU), Dublin, Ireland (2021-2022). EUR 96,417.00

Postdoctoral Fellowship, FAPESP Post-doc fellowship (2018/21537-6). Department of Fundamental Chemistry, Institute of Chemistry, University of São Paulo (USP), Brazil. BRL 265,431.60 + 39,814.74 (contingency).

Patents

Cândido, Tuany Z.; de Paiva, Raphael E. F.; Frajácomo, Silmara C. L.; Nakahata, Douglas H.; Aquaroni, Nayara A. S.; Lima, Carmen S. P.; Corbi, Pedro P.; Lustri, Wilton R.; Ruiz, Ana L. T. G. Monteiro, Karin M.; de Carvalho, João E.; Abbehausen, Camilla. Silver complexes incorporated in bacterial cellulose devices for medicinal applications. Filed to the Brazilian National Institute of Industrial Property, BR 10 2019 022373 1, WO 2021/077191 A1.

This summary reflects my comprehensive experience, from pioneering research to impactful collaborations, contributing significantly to the fields of Bioinorganic Chemistry and Chemical Biology.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | BENITO ROMÁN, OSCAR |
| **Referencia:** | RYC2023-043578-I |
| **Correo Electrónico:** | obenito@ubu.es |
| **Título:** | From biomass to value added compounds using pressurized fluids |

**Resumen de la Memoria:**

Dr. Óscar Benito-Román (OBR) is currently a post-doctoral researcher at Industrial and Environmental Biotechnology Research Group (BIOIND) of the University of Burgos (UBU - Spain) since October 2016. He received his PhD in Chemical Engineering at the University of Valladolid (in March 2013) where he enjoyed international stays in Universities of Germany, Japan and Canada. In 2014 he joined as post-doctoral Marie Curie fellow the European Project Winesense, spending 7 months in FeyeCon D&I (Netherlands) where he worked in product development and transfer of knowledge between academia and industry. In 2016 he started his post-doctoral period at the University of Burgos in the BIOIND research group, where he has been working since then, first in contracts linked to research projects (in the frame of Contrato de Acceso al Sistema de la Ciencia e Innovacion) and then as principal investigator of the project VALPECTIN (PID2020-116716RJ-I00) funded by AEI (call Proyectos I+D+i 2020, JIN). Besides R&D, mentoring of students and dissemination of knowledge, the applicant is committed with the transfer of knowledge to the industry, as the several awards obtained and the promotion of a UBU spin-off with other members of BIOIND demonstrates. The applicant has received specific training in R&D management and entrepreneurship. All this experience has allowed him to obtain the R3 certificate as "investigador consolidado" in the 2023 call.

The research activity of OBR has been primarily focused on process intensification and the use of emerging and green technologies based on pressurized fluids (mainly water and CO2) applied to different fields including extraction, formulation and pasteurization. The applicant recent research activity is mainly linked to the agri-food industry focused on the valorisation of the wastes it generates. The applicant proposes the use of clean technologies based on pressurized fluids (water and CO2) to recover high-added value compounds (antioxidants, carbohydrates, proteins or pectins) that once purified by membrane technology, can be later validated by the industry. By following this strategy, not only a reduction in the waste generation is achieved but also the creation of an economic benefit by generating new products and opening new market opportunities, following a circular economy approach is obtained. The applicant is principal investigator of the project VALPECTIN and is well established in the BIOIND research group, where he cooperates in other research projects currently under development also related to biomass valorisation. The applicant, in comparison with his pre-doctoral stage, has been able to widen the researchers he cooperates with (in Spain and abroad), assuming new responsibilities, cooperating actively with the industry (he is committed with the transfer of knowledge), mentoring students and working on new topics besides extraction, such as purification and fractionation by membrane technology. These results of his post-doctoral stage at UBU in terms of project management, publications (34), dissemination and transfer of knowledge have only been possible after 6 years of continuous work at BIOIND.

Further research interests focus on the valorisation of lignocellulosic materials to obtain nanocellulosic materials using pressurized fluids, contributing to the transition to the circular economy.

**Resumen del Currículum Vitae:**

Dr. Óscar Benito-Román (OBR) is a post-doctoral researcher at the BIOIND Group of the University of Burgos (UBU, Spain) since October 2016 and recognized as "investigador consolidado" in the R3-2023 call. He graduated in Chemical Engineering at the University of Valladolid (UVa - Spain) in 2007, where received his PhD in Chemical Engineering in 2013. His research activity has been focused on process intensification and the use of emerging and green technologies based on pressurized fluids (water and CO2). The results of the research activity of the applicant have yielded of 34 research papers (h index 18), some of them co-authored with international researchers, acting as corresponding author in 10 of them.

The applicant first contact with R&D happened at the Technical University of Denmark (2006-07) as Erasmus student. Then, he joined the High Pressure Processes Group (UVa, Prof. Cocero) for the period 2007-2015. At this time, he enjoyed several international stays at TUHH (Germany, 2011), Nagoya University (Japan, 2012) and University of Alberta (Canada, 2013, as post-doctoral researcher). In 2014 he joined the European project "Winesense" as post-doctoral Marie Curie Fellow on secondment in the company FeyeCon D&I (Netherlands), where he participated in transfer of knowledge between industry and academia. Since 2016, OBR has been hired as post-doctoral researcher at the UBU in the frame of Contrato de Acceso al Sistema de la Ciencia e Innovacion until November 2021, when he gained the project VALPECTIN (PID2020-116716RJ-I00) funded by Agencia Estatal de Investigación (call Proyectos I+D+i 2020, JIN – Jóvenes Investigadores), being the principal investigator of this project. OBR has participated in one European project, 6 projects funded by Agencia Estatal de Investigación (one as principal investigator), and 4 funded by the regional government of Castilla y León.

OBR, as part of the dissemination strategy, participates regularly in scientific conferences in the field of the Chemical and Green Processes Engineering. His expertise in the field of the biomass valorisation and pressurized fluids technology, has allowed him to participate as reviewer of several Journals from the main editorials. The applicant has also participated in research projects funded by private companies, related to the technology transfer and the development of industrial-scale processes. Likewise, the applicant has been awarded in the calls VI Prueba Concepto and VIII Lanzadera Universitaria (UBU). This interest in the transfer of knowledge has encouraged him to promote the creation of a UBU spin-off to exploit the results of the research obtained through the years. This initiative has been awarded the second prize in the "Campus Emprendedor" (Junta de Castilla y Leon, call 2021). He has received specific training for R&D Management (La Gestión de la I+D, UNED), the development of business ideas and the creation of start-ups. The research activity is accompanied with teaching activities (more than 200 hours), co-directing 8 Degree Thesis and 4 Master Thesis. Accredited by ANECA as "Profesor Contratado Doctor" and possessor of one "Sexenio de Investigación" (2012-2018) accredited by CNEAI, the applicant has been member of the thesis committees 4 times. This career has allowed him to develop competences such as leadership, independence and responsibility.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | GARCÍA GARCÍA, GUILLERMO |
| **Referencia:** | RYC2023-043018-I |
| **Correo Electrónico:** | garciagarcia.ggg@gmail.com |
| **Título:** | Sostenibilidad en la industria alimentaria |

**Resumen de la Memoria:**

My academic research experience and interests are in the area of sustainability analysis. Most of my work has been on waste management in the food sector. In particular, I have extensively researched ways to manage and valorise food waste to reduce its environmental impact. I have also performed sustainability analysis of agri-food systems and investigated ways to capture gas emissions from the industry and produce valuable chemicals. I am currently applying methodologies that I mastered in my pre-doctoral and post-doctoral research, such as Life-Cycle Assessment to study environmental impacts and Analytical Hierarchy Process to solve multi-criteria decision problems. My main goal is to find more sustainable alternative solutions in the food sector and to quantitatively prove that they are more beneficial. Specifically, I am now using these methodologies and approaches to investigate sustainable waste valorisation options in the olive oil sector, which is a key food sector in the region where I am developing my current research.

The project to be developed during the Ramón y Cajal programme will aim to sustainably obtain valuable resources from food waste materials. This is therefore a logical continuation of the research I undertook during my 10 years' research experience and, as such, I will be prepared to apply all my acquired knowledge. The initial feedstock to be used will be waste from the olive sector, which is a feedstock I recently started working with. When positive results are obtained, the technologies and processes will be applied to another important food waste: horticultural waste. In particular, extractive technologies will be used to obtain high value-added compounds of potential commercial interest. The remaining waste will be sent for energy conversion, which will help to reduce external dependence on fossil resources, while providing an economic benefit at a subsidised rate or, preferably, the reduction of external energy inputs.

The extraction processes will be based on hydrothermal treatments at low temperatures to achieve low energy use. Next, the main technology to be explored and trialled will be a continuous two-stage reaction process based on pyrolysis and an innovative light-assisted gas steam reforming process to optimise hydrogen production. Applications of the remaining solid char, such as use as an adsorbent, will also be explored.

The overall objective will be to propose alternative innovative processes that improve the sustainability of food waste management. A techno-economic assessment will also be carried out to make sure that the processes proposed can be scaled up industrially and that they can provide economic benefits.

**Resumen del Currículum Vitae:**

I have more than 10 years of experience both in industry and academia. I have worked in different companies, organisations and universities in Spain, Poland, Germany and UK. I am specialised in the fields of waste management, environmental impact analysis and sustainable engineering.

During my five-year degree in Chemical Engineering, I specialised in the field of bioprocess engineering in food production operations. My first work experience was in the microbiology section of the production laboratory of Puleva S.L., where I detected, identified and quantified bacteria, moulds and yeasts in dairy products. Afterwards, I moved to Poland, where I participated in the European Voluntary Service programme and then taught Spanish in a language academy. Next, I worked in the R&D department of a large food company in Germany, where I analysed the effect of enzymes on collagen and implemented food dyes in edible collagen casings.

In 2014 I was recruited as a Research Assistant at the Department of Mechanical and Manufacturing Engineering in Loughborough University (4th best university in the UK, The Guardian University Guide 2020). I assessed the sustainability of food waste management practices to identify opportunities for optimisation. I completed industrial cases with two large food manufacturing companies, for which I identified more sustainable food waste management practices. I received an 'Excellent Performance' award from Loughborough University in 2017. I also completed a PhD at Loughborough University, with a thesis entitled 'Developing a framework for the sustainable management of industrial food waste'.

After completing my PhD, I was promoted to a Postdoctoral Research Associate position. I investigated ways to reuse industrial food waste to create new food products and avoid waste generation. I quantified the environmental impacts of food waste valorisation using Life-Cycle Assessment (LCA) methodology. I also applied the material flow analysis technique to model waste generation and flows of waste streams. I worked with four major UK food producers to ensure that the technologies and processes developed in the project are applicable on an industrial scale.

Next, I got a research position at the Department of Chemical and Biological Engineering in The University of Sheffield (104th university in the world, QS World University Rankings 2024). I analysed the environmental impacts, economic performance and social acceptability of carbon dioxide utilisation technologies using LCA and techno-economic analysis. Our work is currently being implemented in a pilot plant at a refinery in Turkey.

Next, I got granted a Juan de la Cierva - Incorporación position at the Institute for Agricultural and Fisheries Research and Training (IFAPA) of the Andalusian Regional Government. I investigated ways to increase the sustainability of agri-food systems in the Mediterranean region, so that environmental and economic impacts are minimised and social benefits are maximised.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

Currently, I work at the Department of Chemical Engineering in the University of Granada with a Marie Sklodowska-Curie Actions - Postdoctoral Fellowships position, where I am investigating the valorisation of waste from the olive oil industry.

**Área Temática:** Ciencias y tecnologías químicas
**Nombre:** MATEO MATEO, DIEGO
**Referencia:** RYC2023-043505-I
**Correo Electrónico:** metalmat86@gmail.com
**Título:** Multifunctional materials for the production of solar fuels and chemicals

## Resumen de la Memoria:

The candidate presents a broad postdoctoral experience in the preparation and characterization of advanced multifunctional materials for the photocatalytic production of solar fuels and commodity chemicals. More recently, his research focus has shifted to the combination of traditional thermo-catalysis and photo-catalysis into a single process (photo-thermal catalysis). Over the years, the candidate has been growing in independence in research and becoming increasingly responsible for directing his own research lines. Proof of this increasing responsibility has been his appointment to Research Scientist in KAUST to lead his own research group since November 2022. As scientific staff of KAUST, the candidate is co-principal investigator in two 2-year projects funded by SAUDI ARAMCO namely: "Photo-thermal decomposition of ammonia" and "Photo-thermal catalytic decomposition of methane". The candidate is also participating as co-PI in a collaboration project (OPP22-TNI-001) for the development of a photocatalytic proof of principle unit with the Dutch company Avantium Chemicals S.V. In addition, Diego Mateo is work package (WP 2) leader in the granted project "ECO2+" funded by Generalitat Valenciana. During his career, the candidate has acquired teaching experience with the co-supervision of two PhD. students and three Master Thesis. It must be highlighted the candidate's participation in dissemination and outreach activities such as the program "Talleres Conciencia Quimica". Diego Mateo has also launched different press releases echoing his research in different media. Since 2022, the candidate is part of the Early Career Advisory Board of "Catalysis Communications" where he is currently serving as Executive Guest Editor for the Special Issue "Photo-thermal/plasmonic catalysis for the production of solar fuels and chemicals". Furthermore, he is also regular reviewer of prestigious scientific journals such as Nature Communications, ACS Catalysis and Applied Cat. B: Environmental, among others. Diego Mateo has been also selected as an Expert Evaluator of proposals under the call HORIZON-CL5-2024-D3-01 from the European Comission. As evidence of the work developed, the candidate is author or co-author of 28 scientific documents, including 3 reviews and 25 scientific papers, being corresponding author in 3 of them. The valorization of $CO_2$ and the chemistry of ammonia will be the main focus in the candidate's research during the next few years. He will explore the synthesis of new photo-thermal catalysts derived from MOFs, bio-molecules or plasmonic materials. Diego Mateo will also focus his research on new structured materials with customized morphologies to enhance the absorption of light, improve the heat management or prevent the deactivation of the catalyst under reaction conditions. Furthermore, the candidate is especially interested in understanding the synergies between light and heat. To this end, the candidate will develop in situ characterization techniques both under dark and light conditions to study the reaction intermediates involved. With all this fundamental knowledge, the candidate aims to expand the integration of light in other areas such as electro-catalysis to further explore the synergies between the driving forces.

## Resumen del Currículum Vitae:

The candidate was graduated both in Chemistry and Food Science and Technology in 2009 and 2011, respectively, at the University of Valencia, where he received an Extraordinary Graduation Award. After that, in 2015 he was awarded with a Severo-Ochoa grant to pursuit a PhD in Prof. Garcia's group at the ITQ (UPV-CSIC). During his PhD, the candidate developed skills in the synthesis and characterization of graphene-based materials and other semiconductor oxides as hosts of metallic nanoparticles. Furthermore, the candidate studied the photocatalytic properties of these materials for the production of solar fuels from water or carbon dioxide.The candidate defended his PhD thesis in April 2019 and for that he received the Extraordinary PhD Award from the UPV. Furthermore, Diego Mateo's thesis was awarded with the Aragon Hydrogen Foundation PhD Award and the BASF-ICIQ Award for the best Doctoral Thesis. After a short postdoctoral period at the ITQ, in September 2019 the candidate expanded his international experience and moved to the King Abdullah University of Science and Technology (KAUST) in Saudi Arabia as a postdoctoral fellow. The candidate joined the group of Prof. Gascon at the KAUST Catalysis Center, a world-leading institution in the field of heterogeneous catalysis. During his postdoctoral stage, the candidate established a new line of research devoted to explore the synergies between thermal and classical photo-catalysis. With this aim, the candidate customized a complete photo-thermal setup consisting in a high-pressure continuous flow reactor equipped with a radiation source. This setup allowed the study of photo-reactions under external heating at a wide range of operating conditions of pressure and temperature. He has published 28 scientific documents, including 3 reviews and 25 scientific papers, being corresponding author in 3 of them. He has a total 2031 citations and a h-index of 23. He has also participated in 16 National and International Conferences contributing both poster and oral presentation. Over the years, the candidate has been growing in independence in research and becoming increasingly responsible for directing his own research lines. Proof of this increasing responsibility has been his appointment to Research Scientist in KAUST to lead his own research group since November 2022. Thus, the candidate is co-supervising two PhD. students. Diego Mateo is also co-principal investigator in two R&D projects funded by SAUDI ARAMCO (above 500.000 USD) and work package (WP 2) leader in the granted project "ECO2+" (20.000 €) funded by Generalitat Valenciana. The candidate is part of the Early Career Advisory Board of "Catalysis Communications" where he is currently serving as Executive Guest Editor for the Special Issue "Photo-thermal/plasmonic catalysis for the production of solar fuels and chemicals". He is also regular reviewer of scientific journals such as Nat. Comm, ACS Catalysis and Applied Cat. B: Environ., among others. Diego Mateo is also Expert Evaluator of proposals under the call HORIZON-CL5-2024-D3-01 from the European Comission in the topic of "Next generation of renewable energy technologies". Diego Mateo has also participated in dissemination and outreach activities with undergraduate students such as the program "Talleres Conciencia Quimica" organized by UPV in 2018 and 2019. He has also launched different press releases ("Where I work: Diego Mateo" KAUST Insight Magazine) echoing his research.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | ORTEGA LIEBANA, MARIA DEL CARMEN |
| **Referencia:** | RYC2023-044340-I |
| **Correo Electrónico:** | mcol_1988@hotmail.com |
| **Título:** | Nanoengineering CAR macrophages enable precise live-cell biorthogonal chemistry |

**Resumen de la Memoria:**

I am a passionate scientist with the declared goal of promoting drug innovation in Spain while training the next generation of chemical biologists. Overall, I aim to innovate (nanotech) strategies to probe, understand and eventually fight cancer-tumour cells.

I have a strong multidisciplinary background, gained by working in different research fields (such as nanoscience, biomedicine, chemistry, biosensing and environmental sciences) and professional environments (8 academic institutions from Spain, Hong Kong, The Netherlands, France, and United Kingdom). During my PhD at UNIZAR (Jesus Santamaria), I gained in-depth knowledge on the design and synthesis of a wide variety of nanomaterials, and my results seeded a successful ERC consolidator grant. I expanded my training with 2 international internships at Prof. King Yeung's group (HKUST) and Prof. Pouyan Boukany's group (TU Delft). Aiming to intervene in a more direct manner in biomedical field, I moved to France to take a postdoc position in supramolecular chemistry and chemical biology in the group of Luisa De Cola (UNISTRA), where I became proficient at research in the emerging fields of bioinspired nanosystems and targeted drug delivery. After securing a competitive Marie-Curie Fellowship, I started my second postdoc in the Unciti-Broceta's group (UEDIN, UK). Where I focused my research on the design and synthesis of new prodrugs and nanomaterial-based catalysts that combined can release bioactive agents safely in the central nervous system (CNS). While I enriched my researcher in the emerging field of bioorthogonal chemistry, I initiated my own research line and introduced a completely new concept in UEDIN. Moreover, I obtained my own funding via three competitive projects (IGMM Award 2020, MRC-P2D Award and WT iTPA 2021) that supports the advancement of talented scientists in the early stages of our careers, which was enhancing my recognition as a self-motivated translational scientist. Subsequently, I established my own research unit with the support of a prestigious Maria Zambrano grant. I lead the plasmonic nanovectors lab in the group of Prof. Sanchez-Martin (UGR). Capitalizing on my expertise in the field, my research is focus on (1) developing "smart" Nanobots that reach tumors, and (2) tackling local and efficient treatments by delivering therapeutic mRNA. Recently, I was granted funding as emerging principal investigator (FEDER-2023), which guarantees the consolidation of my research group.

My multidisciplinary research program will focus on building nanoengineering CAR macrophages to activate small drug molecules in situ and help us fight cancer. This advantageous position will allow me to introduce a new field to Spain and build a national network and expand it using my contacts and translate this into an International Training Network. I will seek funding support to open opportunities to host and provide direct mentorship, sponsorship and academic coaching for young under-represented scientists. I have applied to a National Grant (Knowledge Generation Projects 2023) and for the Junior Leader Group position of la Caixa which I have successfully passed for the final interview (due on Feb 2024). I believe that due to my experience in the UK and in Europe, I consider myself a strong candidate to acquire European and National Funding, and to bridge between both continents.

**Resumen del Currículum Vitae:**

After completing my MSc studies in Advanced Chemistry with first class honors, I started as a research assistant funded by two EU-research projects, and in 2014 I obtained a FPU-Fellow to perform my PhD with Jesus Santamaria (UNIZAR). During my PhD, I took the initiative to start a new research line (biocatalysis) from the scratch, and I opened and explored unprecedented opportunities in many fields. Aiming to intervene in a more direct manner in biomedical field (cancer treatment, autoimmune diseases and cosmetic), I decided to do a postdoc in supramolecular chemistry and chemical biology with Luisa De Cola (ISIS-UNISTRA), where I became proficient at research in the emerging fields of bioinspired nanosystems and targeted drug delivery. I also participated in projects in collaboration with the pharmaceutical (Novartis) and cosmetic (L'Oréal) industries. After securing a competitive MSCA-IF, I moved to UEDIN to start my second postdoc in the Unciti-Broceta's group. This research experience was an excellent opportunity for me to develop my leadership skills and to broaden my expertise to translate advanced scientific work to industry. In 2022, I received the highly competitive Maria Zambrano grant to develop my independent research line. I decided to join force with Prof. Sanchez-Martin (GENYO-UGR) and open my own research unit. From April 2022, I am pushing the limits of nanomedicices to improve the efficiency of conventional cancer treatments. Recently, I was granted funding as PI to start my new position in April 2024 as Emerging Group Leader.

My academic efforts to date have resulted in the publication of 19 peer-reviewed research articles (13 of them as the first author, 15/4 Q1/D1) in high impact international journals (Angew. Chem., Nano Letters, Chem. Mater, Chemical Science, etc.), and have more than 519 citations resulting in an h-index of 13 (WoS). In addition, two articles are under review in Angew. Chem. as corresponding and first author, and in Org.Biomol.Chem. (collaborationSieber group, TU Munich). So far, I have built and worked with 15 collaborators from all over the world (from industry and academia). My communication abilities have been significantly strengthen by participating in 33 international congresses (12 oral contributions, 3 plenary talk and 4 best talk awards). Throughout my scientific career, I have actively participated in teaching (34 ECTS) and outreach activities. In 2022 I obtained the ANECA accreditation of "Contracted Doctor". I am engaged to disseminate science to broader audiences. Moreover, I am very committed with mentoring younger scientists, science outreach and the promotion of women in academia. My leadership indicators are consolidated by evaluating grant, reviewing tasks, scientific nanotech advisory board, scientific committees, organizing committee and invited talk, while training of young investigators (1MSc, 5 PhD, 5 PhD examinations) and mentored many other colleagues. I was awarded for CRUK Entrepreneurial Programme (1 of 4 in the UK), Panacea Innovation, Converge and Spin-Up Science, competitive programs for emerging leader in research innovation. The internationalization and impact of my research is evidenced by indicators such as securing my own funding with highly competitive European fellowships and grants in every step of my career (eg.FEDER-2023, Maria Zambrano, MSCA-IF, IGMM Award-2020), successfully planning and executing cutting-edge science in a highly collaborative way.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | GRESES HUERTA, SILVIA |
| **Referencia:** | RYC2023-045083-I |
| **Correo Electrónico:** | silvia.greses@imdea.org |
| **Título:** | Biotechnology innovation for waste valorization into bioenergy and biocompounds |

**Resumen de la Memoria:**

The candidate has been fully dedicated to scientific research for more than 11 years. Her research career shows a noticeable multidisciplinary character with emphasis on biotechnologies development for waste valorization. The research line of Dr. Silvia Greses was firstly focused on biogas production via anaerobic digestion (AD) of different wastes. This line was completed by valorizing the anaerobic digestion effluent (rich in nitrogen and phosphorus) via microalgae culture, which produces a clean effluent and a microalgae biomass that can be also converted into biogas via AD. The microalgae AD was the main goal of the applicant's PhD Thesis in which, she reached outstanding AD performance by implementing alternative reactor technologies at the University of Valencia. Moreover, she elucidated the effect of reactor configuration on microbial community by analyzing the 16S rRNA gene and applying biostatistical tools in the NMBU (Norway). This stay aroused her interest in combining engineering and microbiology fields to develop innovative biotechnologies. Since 2018, Dr. Greses extended her research line to carboxylates production from organic wastes (microalgae biomass, food waste, municipal solid waste) at IMDEA Energy. In this line, she optimized the operational parameters to manipulate the AD microbiome, finding the relevant microorganisms involved in the fermentative stage (named anaerobic fermentation) and producing carboxylates. She is in charge of the microbial analysis of the bioprocess, leading the investigation of microbiome response to process modifications and perturbances. Within this research line, the open-mixed microbiome reshaping based on her previous knowledge allowed her to maximize waste valorization by producing different valuable products in single-stage reactors (carboxylates, H2 and lactic acid) and also by developing a cascade combination of biotechnologies to maximize the number of products from a single residue (carboxylates, H2, ethanol and biogas). Lately, the elucidation of the active metabolic pathways (not only microorganism identification) has also become an important pillar in her research. Her initial studies on this line support and help her in moving toward a better understanding of biological behaviors. The extensive knowledge developed during her scientific career and the excellence of her results can be proven by the project (RAVIOLIC-TED2021-132809A-I00) obtained by Dr. Greses, which has given her the opportunity to lead her first project as PI. In this project, she is focused on the development of an innovative bioprocess for bioethanol production by enabling an ethanologenic microbiome from open-mixed cultures. To continue expanding her research line, Dr. Greses plans to manipulate open-mixed cultures by complementing her current approaches (reactor configuration and process conditions) with bioaugmentation/evolutionary engineering strategies using endogenous/exogenous microorganisms, and exploring the utilization of extremophiles. Her results together with her research career developed in several projects and her activity in national and international networks have made Dr. Greses familiar with top European researchers and created a wide international network. In this manner, Dr. Silvia Greses has proven strong motivation for a research career and independence.

**Resumen del Currículum Vitae:**

Dr. Silvia Greses is Senior Assistant researcher in the Biotechnological Processes Unit (BTPU) of IMDEA Energy. She got a Chemical Engineering degree (2010) a MSc. in Environmental Engineering (2012) at the University of Valencia (UV). In 2018, she got her PhD in Chemical, Environmental and Process Engineering with international mention at UV (cum laude). She carried out her thesis in the field of microalgae biomass valorization into biogas via anaerobic digestion (AD), gaining deep knowledge in anaerobic bioprocess optimization using different reactor configurations, scales and operational conditions. In this period, she performed a research stay of 4 months at the Norwegian University of Life Sciences (Norway), which allowed her to study the microbial communities involved in AD through the 16S rRNA gen analysis, learning bioinformatics and biostatistical tools. Proof of the results relevance, Dr. Greses was awarded the best doctoral thesis on Wastewater Management and Resource Recovery. In 2018, she joined BTPU as postdoctoral researcher where her research was focused on the development and optimization of biotechnological processes for organic wastes valorization into bioenergy and bioproducts. This research line included biotechnology development and microbiome analysis to establish key relationships with process outcomes. During this period, she enjoyed 2 more research stays. For 3 months, she performed a research stay at the University of Padova (Italy, 2021) to gain knowledge in metabolic pathways analysis using metagenomic techniques. Dr. Greses also performed a 3-months research stay at LBE-INRAE (France, 2023) to learn AD mathematical modeling and aimed at estimating process behavior. Recently, Dr. Greses has been promoted to Senior Assistant researcher in BTPU, where she is expanding her research line based on the manipulation of open-mixed cultures to produce target biochemicals, such as ethanol. Moreover, she is technical responsible for BIOPEN Laboratory 370 belonging to the RedLab of Comunidad de Madrid. During her research career, she taught 120 hours and has supervised 3 Final Degree Projects, 6 Master thesis, 1 practicum and mentored undergraduate/graduate students. She is currently supervising 2 PhD thesis, 1 MSc. Thesis and 1 technician. She is co-author of 29 scientific publications (GoogleScholar: h index 14, 80% in IME, 83% Q1, 38% CA, 25% international collaboration, 17% industrial collaboration, 20% in top 10% most cited, > 10000 views, 639 cites), has co-authored 29 scientific communications to national/international conferences and workshops. She has been member of the Evaluation Committee in 1 PhD Thesis, 2 COST Actions and member of national/international networks that increases her visibility and collaborations. She has collaborated in 16 national and European projects, including projects with private companies. Currently, she is PI of a national project (TED2021-132809A-I00), which is focused on bioethanol production via modified AD. Her scientific career has been completed with important efforts to disseminate research to scientists and general public as can be proved by her interview in iAgua.es, participating in European Researchers Night, Science Week and Women in Science events and organizing international training schools for organic waste valorization using biotechnologies.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | MARTÍN SABANÉS, NATALIA |
| **Referencia:** | RYC2023-045540-I |
| **Correo Electrónico:** | natalia.martinsab@gmail.com |
| **Título:** | Development of nearfield vibrational spectroscopies operating in the single-molecule regime |

**Resumen de la Memoria:**

Technology's trajectory has been toward smaller, more efficient devices, emphasizing the pivotal role of nanoscience and nanotechnology in fostering sustainability across various sectors such as energy conversion, electronics, and medicine. This evolution necessitates instruments capable of probing materials at their relevant length and time scales, a pursuit central to my career. I have dedicated myself to developing such instruments, amalgamating various spectroscopic, surface science, and single-molecule techniques to push spatial and temporal resolution to the nanometer and femtosecond limits.

I worked on tip-enhanced Raman spectroscopy (TERS) during my PhD in Max Planck Institute for Polymer Research in Mainz and on THz-gated scanning tunneling microscopy during my first postdoc in Fritz Haber Institute in Berlin, building unique setups in both institutions. Their successful development granted me in 2020 a Marie Sklodowska Curie (MSCA) individual fellowship, which allowed me to move to IMDEA Nanociencia.

At IMDEA nanociencia, I am spearheading the establishment of TweeTERS, a groundbreaking instrument that combines cutting-edge technologies in optical tweezers and tip-enhanced Raman spectroscopy. Upon completion of the construction phase, I plan to embark on two concurrent research lines with TweeTERS. Firstly, I aim to investigate various supramolecular systems, focusing on understanding the role of hydrogen bonds—a fundamental force in biology and chemistry. These investigations will delve into the nature of intermolecular interactions, probing and manipulating individual hydrogen bonds in real time. Additionally, motivated by my passion for instrument development, I intend to optimize TweeTERS for broader scientific applications. Specifically, I aim to probe the fundamentals of the nearfield Raman process, addressing critical questions regarding enhancement dependence on distance and the effect of dipole-dipole interaction in TERS and SERS. Furthermore, in alignment with IMDEA's research on novel 2D heterostructures, I plan to explore the mechanical exfoliation of 2D $MoS_2$ using optical tweezers, with the goal of experimentally quantifying interlayer interactions.

Through these projects, in collaboration with experts in supramolecular systems and single-molecule manipulation, I seek to deepen our understanding of intermolecular interactions and advance the practical applications of nanoscience. This multifaceted approach promises to yield significant insights into the behavior of nanomaterials, laying the groundwork for transformative advancements in various scientific disciplines.

**Resumen del Currículum Vitae:**

I'm a physical chemist with a strong background in single-molecule research, specializing in the integration of nearfield spectroscopy with scanning tunnelling microscopy (STM) and optical tweezers. After completing my BSc/MSc in Physics in Madrid, I moved to Germany in 2013 to start my PhD. I spent over 7 years in Germany (PhD and 1 postdoc), working in top-level institutions, before returning to Madrid in 2020 as a Marie Sklodowska Curie postdoctoral fellow at IMDEA Nanociencia.

During my doctoral studies at the Max Planck Institute for Polymer Research, I focused on the development of electrochemical tip-enhanced Raman spectroscopy (EC-TERS) for probing single-molecule processes at the electrochemical interface. This involved designing and building a novel setup capable of operating under electrochemical conditions, enabling in situ investigations with unprecedented spatial and temporal resolution. I used the setup to investigate the oxidation mechanism of DNA bases in metalic electrodes, disentangling the adsorption and orientation of a molecular monolayer as a function of electrode's potential.

In Berlin, during my postdoctoral tenure at the Fritz Haber Institute, I delved into ultrafast nearfield spectroscopies, particularly working on the development of a THz-gated ultrafast scanning tunneling microscope coupled with optical excitation (THz-STM). I successfully coupled an ultra-broadband spintronic-THz emitter to the instrument, achieving the fastest transient ever reported in a THz-STM and advancing the temporal resolution of this technique significantly. Additionally, I investigated hot electron dynamics within confined nanotips of STMs, contributing to the understanding of ultrafast processes at atomic scales.

At IMDEA Nanociencia, my current research focuses on the development of a hybrid instrument that combines single-molecule optical tweezers with TERS for studying supramolecular systems. Specifically, I aim to tackle fundamental questions about the properties of non-covalent interactions within these systems, with special emphasis in H-bonding. This project is in an advanced stage of development, leveraging the institute's investment in state-of-the-art optical tweezers instrumentation. Moreover, I'm engaged in various projects exploring advanced nearfield techniques for characterizing 2D materials and heterostructures, as well as investigating the dynamics of supramolecular systems using optical tweezers.

My contributions to the field include major technical advancements in the field of nearfield spectroscopy that enable access to the single-molecule regime with unprecedented spatial and temporal resolution. These achievements have been recognized through publications in prestigious scientific journals, presentations at international conferences, and the acquisition of competitive funding, including the MSCA fellowship. Furthermore, I have actively participated in international consortia and collaborations with industrial partners, mentored students, contributed to teaching activities, and engaged in science outreach initiatives, including mentoring young women in STEM programs.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | SUAREZ , SEBASTIAN |
| **Referencia:** | RYC2023-042682-I |
| **Correo Electrónico:** | sebasuarez85@gmail.com |
| **Título:** | Aplicaciones de HNO: una pequeña molécula con gran potencial |

**Resumen de la Memoria:**

Mi experiencia se centra en el estudio de especies reactivas de oxígeno (ROS) y de óxido de nitrógeno (RNOS), y de gasotransmisores. He logrado hitos innovadores, como el desarrollo de un nanosensor de nitroxilo (HNO) y la formulación de sistemas de liberación de moléculas con HNO. Además, he aprovechado las notables capacidades del nanosensor para adentrarme en una nueva línea de investigación. El objetivo general de este proyecto es explorar la generacion endogena de HNO asi como sus aplicaciones junto al óxido nítrico (NO), buscando comprender a fondo los efectos biofísicos, químicos y estructurales de la interconversión del HNO y el NO en los sistemas biológicos. Estas dos moléculas a menudo ejercen efectos opuestos, lo que las convierte en un valioso sistema que puede ajustarse con precisión para lograr los resultados deseados. Este proyecto tiene como objetivo integrar sinérgicamente diversas áreas de investigación en las que he trabajado en los últimos dieciocho años, aportando una combinación única de conocimientos en química biofísica y ciencias estructurales, respaldada por una amplia experiencia investigadora en la intersección de la química, la biología y la biofísica.

Especificamente, en el contexto global de la inseguridad alimentaria y la malnutrición, la patata (Solanum tuberosum L.) emerge como uno de los cultivos más importantes para el consumo humano. Alrededor del 35% de la patata se produce en Europa, siendo España es el octavo mayor productor de la UE, con 2 millones de toneladas/año. La patata es susceptible a una amplia gama de organismos patógenos, que pueden causar graves pérdidas de calidad y rendimiento en todo el mundo. Teniendo en cuenta que los patógenos superan la resistencia vertical de los cultivares resistentes y la rápida evolución de la resistencia de los patógenos a los fungicidas, cualquier intento de comprender y reforzar los conocimientos sobre los factores relacionados con la inmunidad natural de la patata es extremadamente importante. El descubrimiento de la producción endógena de HNO en tejidos vegetales sugiere un papel regulador novedoso. Por lo tanto, este proyecto se propone diseñar y desarrollar sensores de ROS y RNOS para detectar y visualizar en tiempo real la producción simultánea de HNO y NO endógenos. Posteriormente, se monitorizará el HNO y el NO en patata, evaluando la interconversión redox HNO/NO para respuestas efectivas de defensa contra patógenos, junto con la realización de un perfil completo del estado redox celular. Para profundizar en el conocimiento del mecanismo de acción del HNO endógeno, se llevarán a cabo estudios estructurales in situ y en tiempo real de las interacciones de proteínas vegetales seleccionadas con el HNO y otros ROS/RNOS. Finalmente, se seleccionará racionalmente la mejor opción para limitar y prevenir la infección en los cultivos, utilizando al menos tres donantes de HNO estructuralmente distintos. Se evaluará qué donante de HNO, teniendo en cuenta su amplia vida media, puede ser más adecuado para uso agrícola. Aunque la propuesta se enfoca en la patata como modelo experimental de investigacion simple, la metodología propuesta permitirá estudiar y mejorar otros cultivos en el futuro, como cereales y frutas.

**Resumen del Currículum Vitae:**

Máster y doctor en química con especialización en química bioinorgánica y estructural, mi trayectoria profesional ha abarcado la investigación científico-tecnológica, la docencia y la gestión institucional. He participado activamente en la divulgación científica y mantenido un enfoque firme en desentrañar la intrincada relación entre la estructura molecular y la función, guiando el diseño racional de los sistemas estudiados. He desarrollado un innovador nanosensor y un sistema de liberación de fármacos que utiliza la molécula endógena (HNO) para la protección cardiovascular. Actualmente me dedico a desarrollar un prototipo funcional del sensor y buscar adoptantes para su producción a escala comercial. Aprovechando los puntos fuertes del nanosensor, exploro los efectos biológicos de la química del HNO en las plantas y su modulación de la infección por Mycobacterium tuberculosis. Además, tengo amplia experiencia en química estructural.

Desde 2024, ocupo el cargo de Profesor Asistente en la Universidad Adam Mickiewicz de Polonia, gracias a una beca Marie Curie. En el Departamento de Ecofisiología Vegetal contribuyo al avance de los conocimientos científicos sobre química bioinorgánica. Anteriormente, desempeñé un papel integral en varios grupos de investigación en instituciones académicas destacadas de Argentina. Fui Vice-Secretario de Investigación en la FCEN-UBA y miembro Titular del Comité Ejecutivo de la Agencia Nacional de Laboratorios Públicos (ANLAP), equivalente a la Agencia Española de Medicamentos y Productos Sanitarios, parte del Ministerio de Salud, hasta mi traslado a Polonia. Previamente, en 2017, obtuve el cargo de Investigador Adjunto en el CONICET, donde he concentrado mis esfuerzos en establecer un grupo de investigación con financiamiento independiente y en explorar temas de investigación novedosos distintos de mis estudios doctorales y posdoctorales. A lo largo de mi carrera científica, he publicado 38 artículos y 5 capítulos de libros en revistas internacionales revisadas por pares de alto impacto, que han obtenido 1197 citas según SCOPUS y un índice h de 15. Forjé colaboraciones nacionales e internacionales, trabajando con investigadores de Chile, Alemania, Polonia, Irán, Bangladesh y Estados Unidos, entre otros. He colaborado con más de 150 coautores y sido autor correspondiente de varios artículos y dos patentes PCT.

Mis puestos actuales y pasados demuestran mi independencia y capacidad de liderazgo. Durante los últimos 7 años, he sido IP de proyectos de investigación. Además, he dirigido dos tesis doctorales y cinco tesis de maestría en la UBA. En la actualidad, superviso activamente la investigación de cuatro estudiantes de doctorado. En cuanto a la formación universitaria, he sido un profesor comprometido con las actividades docentes e investigadoras.. En 2022, obtuve el certificado ANECA en el Cuerpo Académico: Profesor Titular de Universidad, Área de Conocimiento: Ciencias.

A lo largo de mi carrera, he recibido varias becas y premios individuales internacionales, destacando las becas postdoctorales Marie Skodowska-Curie Actions de 2023, el Top 5 en el premio USERN de 2023, la beca 2021 de la Agencia Nacional de Intercambio Académico de Polonia, el Premio Internacional IUPAC-Solvay 2016, y ser el Ganador del Concurso Nacional Innovación con el nanosensor.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | GONELL GÓMEZ, FRANCISCO |
| **Referencia:** | RYC2023-044631-I |
| **Correo Electrónico:** | xisco_gonell@hotmail.com |
| **Título:** | Synthesis of new nanomaterials for new catalytic/electrocatalytic reactions |

**Resumen de la Memoria:**

I have developed my research career in globally recognized research institutes and universities focused in the design and synthesis of nanomaterials with multifunctional properties. During my career, the production of several families of nanomaterials (hybrid organic-inorganic composites, fluorides, oxides, silicides, sulfides and metallic), with a wide range of compositions and involving a huge number of elements, was accomplished by means of an exquisite control of the synthesis conditions and methodologies (coprecipitation, sol-gel, hydrothermal, solvothermal, thermal decomposition, solid-state, molten salts, etc.). The knowledge gained in this field enabled the design and synthesis of the proper nanomaterials with enhanced properties in the field of photonics, photocatalysis, thermal acid-base and red-ox catalysis, electrocatalysis and magnetism.

During my master and PhD (2011-2017, funded by competitive master grant from Santander bank, FPI-UJI and FPU grants and developed at INAM at UJI), I focused my attention in the synthesis of hybrid organic-inorganic composites, fluoride, oxide (titania, zirconia, ceria and yttria) and metal nanomaterials for their study in (i) photonics (optically modulable transparent films and monoliths), (ii) photocatalysis (water splitting, CO2 reduction and water purification) and (iii) thermal catalysis (acid-base and red-ox reactions). Remarkably, by modulating the adsorptive and electronic properties on metal nanoparticles, I was able to increase the selectivity in hydrogenation reactions with industrial interest in collaboration with an industrial partner. The work performed in this period is reflected in 10 publications and 1 patent under industrial exploitation.

In my international postdoctoral stay in France (2017-2020, funded by competitive French contracts at LCMCP at Sorbonne University-CNRS-Collège de France) I worked in molten salt synthesis of multicationic oxides and silicides nanomaterials with different crystallographic structures and in the study of their magnetic and electrocatalytic properties. As a consequence of this work I published 1 book chapter and 7 articles, in one of which I am the corresponding author.

Finally, after my return to Spain and incorporation at ITQ (since September 2020, funded by PAID-UPV as PI), I am implementing and developing a new research line regarding the design and synthesis of new nanomaterials for new catalytic/electrocatalytic reactions. Encompassing the transfer of knowledge from thermal catalysis to the heterogeneous electrocatalysis domains for better understanding the structure of the active sites and collaborating with several industrial partners.

All these shows that I have a versatile scientific experience, large capacity to adapt to new research environment and technologies, high ability to rapidly assimilate new concepts regarding synthesis of nanoparticles and the study of their properties, and high capacity of critical data interpretation. One of the particularities shown is the very wide range of materials that I have investigated, which corroborates great ability to adapt and to transfer novel concepts from one system to another. This has produced a researcher with high level of interdisciplinary expertise, great maturity and independent thinking, capable to lead the scientific lines in which I have been involved during my career

**Resumen del Currículum Vitae:**

During my research career I have focused in the synthesis of nanomaterials with a wide range of multifunctional properties such as photonics, photocatalysis, acid-base and red-ox thermal catalysis, magnetism and electrocatalysis with huge implications in the society advancement and well-being. In this time, I have been awarded continuously with several grants and contracts, being hired during more than 11 years by funding captured by myself.

I have worked in different globally recognized research groups, demonstrating in all the periods a high productivity and independence. My research career can be divided in three main periods: (i) master and PhD performed at Institute of Advanced Materials (INAM) at UJI, (ii) early postdoc in France at " Laboratoire de Chimie de la Matière Condensée de Paris (LCMCP)" at Sorbonne University-CNRS-Collège de France and (iii) researcher in Spain as PI at " Instituto de Tecnología Química" (ITQ) at UPV-CSIC, leading the development of a new research line based on the synthesis of new nanomaterials for new catalytic/electrocatalytic reactions.

I have published 1 book chapter and 20 articles in prestigious and recognized scientific journals. In 12 of those articles I am first author, in 4 I occupy the second position and in 1 I am the corresponding author, highlighting my degree of implication in the published works. Additionally, 2 articles were published in Open Access journals, contributing to make science and knowledge freely available. These contributions were cited 496 times, giving an h index of 12 (Google Scholar), which corroborates the quality of the performed work and the impact in the scientific community. I have also developed collaborative work with several industrial partners. Part of this work produced a patent which is licensed and under exploitation by a company.

I also accumulate 42 months of international mobility: 1 month at " Université Pierre et Marie Curie" (France), 2 months at " Universidade de Aveiro"-CICECO (Portugal), both as predoctoral stays, and 3 years and 3 months of postdoctoral international experience. Additionally, I have visited numerous national and international laboratories, performing fruitful research collaborations.

My findings gave rise to more than 24 contributions in national and international conferences. I have also participated in the organization of 2 international scientific meetings and I am member of 3 scientific societies. I have supervised 4 research works (masters and PhD) and I am referee in prestigious peer reviewed journals. I have participated in 14 projects with public calls. Additionally, I have been awarded with the European Commission

Seal of Excellence of the Horizon 2020 MSCA-IF (call 2020), I am in the reserve list in Ramon y Cajal 2021 call (13th position) and I have obtained funding as PI (PAID-UPV).

I have collaborated in teaching activities (60 hours) and published 2 educational papers. These has allowed me to be accredited as "Profesor Contratado Doctor" by ANECA. Additionally, I have participated in many outreach activities for non-academic audience such as school visits or organization of scientific weeks.

All these has produced a researcher with a large multidisciplinary expertise, great maturity and independent thinking, able to carry out high quality research with a beneficial impact in the society advancement and well-being.

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| **Área Temática:** | **Ciencias y tecnologías químicas** |
| **Nombre:** | SIMON MARQUES, PABLO |
| **Referencia:** | RYC2023-045101-I |
| **Correo Electrónico:** | psimarq@gmail.com |
| **Título:** | Exploiting the photoinduced SO-extrusion of aryl sulfoxides |

**Resumen de la Memoria:**

I am a chemist and PhD in Organic Chemistry and Material Science that has demonstrated the capacity to run exciting projects that goes beyond the state-of-the-art, addressing challenges in the interface between fundamental science and the industry. During my career I used organic synthesis and molecular engineering to unravel scientific queries, preparing, characterizing and applying advanced organic materials for multiple applications, from electronic and sensing devices to theranostics. Currently, I am applying my expertise in photoactive materials and conjugated systems to synthesize unprecedented photoresponsive molecules for their application in the field of on-surface synthesis.

I obtained PhD from the University of Angers, France (2017-2020), where I synthesised and characterised novel organic semiconductors for their application in electronics, and especially in photovoltaics. I gained expertise in different electron-rich and electron-deficient blocks like porphyrins, rylenes, polythiophenes, etc. with important orientations towards the development of synthetic methods for the functionalization of aromatic scaffolsids. In this period, I got the opportunity to be trained in DFT calculations in an internship at Dr. Beljonne's group (University of Mons, Belgium). Thereafter, I have enrolled three different postdoctoral positions at the Max Planck Institute of Colloids and Interfaces, Germany (2020-2021), the University of Calgary, Canada (2021-2022) and the CEMES-CNRS, France (since 2023), improving my background in different multidisciplinary fields. My goal has been to transfer my knowledge in synthesis to different environments such as complex emulsions, processing techniques and on-surfaces synthesis, demonstrating my capacity to carry out organic chemistry no matter the scientific challenge.

My scientific results have been published in 28 peer-reviewed journals and 10+ international conferences. Moreover, my projects have been granted in two different competitive fellowships, the Eyes-High Matching Program and the Junior TIRIS fellowship, as proof of my leadership and independence. In addition, I have a great record of MSc. and PhD supervision and currently, I am a temporary lecturer at the University Institute of Technology (IUT) of Toulouse.

The experience acquired over these years allows me to lead a unique multidisciplinary line of research aiming to develop new organic compounds from a greener perspective, not only from the synthetic point of view, but also the later application as functional materials.

**Resumen del Currículum Vitae:**

I received my BSc in Chemistry (2016) from the University of Zaragoza (UNIZAR). During this time, I enjoyed a summer internship at the Institute of Nanoscience of Aragón, where I also carried out my BSc thesis on the multistep synthesis of porphyrins for the application in organic electronics (supervisor: Prof. Santiago Franco). I then moved to the Autonomous University of Madrid (UAM) to study a MSc in Organic Chemistry (2017) with a dissertation on the synthesis, characterization and application of porphyrins in perovskite solar cells (supervisor: Prof. Gema de la Torre).

Thanks to these previous experiences, I was selected as a MSCA fellow in the International Network Training (INT) SEPOMO, to carry out my PhD at the University of Angers, France (supervisors: Dr. Philippe Blanchard, Dr. Clement Cabanetos). My PhD research was focused on the preparation, characterization and application of molecular materials for their application in organic electronics, such as photovoltaics, OLEDs or transistors. As part of the INT, a multidisciplinary education was followed with my participation in more than six Network Wide Events (NWE), with workshops and conferences, and a secondment of two months at the University of Mons to be trained on theoretical calculations (supervisor: Prof. David Beljonne). During this period I also gained valuable experience as the community manager of the INT and the co-organization of divulgation activities. In 2020, I obtained "with excellent mastery" my PhD in Organic Chemistry and Material Science.

Thereafter, I moved to the Max Planck Institute of Colloids and Interfaces (MPIKG), Germany, to work as postdoc at the Responsive Soft Materials and Interphases group, where I could transfer my knowledge in photoactive materials to the complex emulsion field, gaining expertise in colloids chemistry and surfactants. In 2022, I obtained the Eyes-High fellowship to join the group of Prof. Gregory Welch to work in green processing organic semiconductors. I took advantage of a variety of state-of-the-art synthetic tools mastered at the MPIKG to synthesize alcohol and water soluble organic materials. More recently, I've been awarded with the TIRIS fellowship to develop my projects at the CEMES-CNRS, France. My actual research is focused in the preparation of on-surface synthesis materials based-on photoreactive aryl sulfoxides, bringing together my experience in photoactive materials and conjugated molecules.

In only six years, my research has resulted in many scientific outcomes, and up to now, I have published 28 publications in top peer-reviewed journals in the areas of Material Science, Multidisciplinary Chemistry and Organic Chemistry. I'm first author of 41% of my publications and corresponding author of two of them, which highlights the ability to both, lead projects that goes beyond the state of the art and collaborate with other scientist in multidisciplinary research. My h-index is 10 and my work has been cited more than 240 times. I have also contributed with oral communications to more than 10 international conferences and NWE, and participated in multiple activities of divulgation like the European Research Night and high-school talks. I am regular reviewer for top indexed journals from Wiley, RSC and MDPI. Additionally, I have demonstrated a record of teaching and supervision of undergraduate and PhD students.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | BIOSCA BRULL, MARIA |
| **Referencia:** | RYC2023-045413-I |
| **Correo Electrónico:** | mariabb2k@gmail.com |
| **Título:** | Development of new strategies for C-X (X= B, F, C, O, N, H) bond-forming reactions |

**Resumen de la Memoria:**

I have developed my research activity first at Universitat Rovira i Virgili (Spain, 2014-2018), as PhD candidate, University of Uppsala (Sweden, 2015) and University of Göttingen (Germany, 2017), as visiting PhD student, and later at Stockholm University (Sweden, 2019-2021), as postdoctoral researcher. From 2022, I am Juan de la Cierva-Incorporación postdoctoral researcher at Universitat Rovira i Virgili (Spain). Throughout my scientific journey, my dual training (computational/experimental) has consistently played a crucial role.

I conceptually classify my research career in three main stages; my PhD studies and my two postdoctoral positions. (i) Development of enantioselective metal-catalysts for effective C-X bond forming reactions (PhD studies), where I contributed to broaden the scope of enantioselective synthesis, providing access to a huge variety of molecules that are important for the production of essential medium-sized compounds that our society depends on. (ii) Development of organocatalytic C-F bond forming reactions (Postdoctoral stage at Stockholm University), where I contribute to expanding the toolbox of asymmetric catalysis for accessing organofluoride compounds, a crucial advancement in enhancing the molecular diversity of complex organofluorine species used in life sciences. (iii) Development of new complexes for water oxidation reaction and other reactions of industrial interest (Juan de la Cierva Postdoctoral Fellowship), where I contributed to led and open new research lines that contributed to the development new catalysts for the water oxidation reaction and other metal-catalyzed reactions of interest in the biological, pharmaceutical and organic industry. This research lines have not only translated into different publications in renowned multidisciplinary journals, but also and more important served as the scientific base to obtain one funded projects in which I contributed in the writing and editing stages of the proposals.

My experience acquired during my scientific career in the combination of experimental and computational work allowed me to be involved in the co-direction of younger researchers. I played a crucial role in co-directing two Ph.D. students. Additionally, I taking on the co-supervision of several Master Projects. One of them has already been completed and evaluated with an excellent mark, indicating its successful execution.

In addition to these research activities, I have taken on editorial roles in academic publications. I have assumed the position of editor for a book that will be published in the middle of 2024. In addition, I was also working in a collaboration with Bayer AG related with the Ir-catalyzed asymmetric hydrogenation reaction, that will result in scientific publications and a patent.

To date, I am co-author of 29 publications in peer-reviewed journals (of them 2 as corresponding author, 17 as first author, 8 as second author and 2 as third and fifth author, respectively) and 3 book chapters (of them 2 as corresponding author). In summary, the applicant has a unique expertise that combines a complete battery of experimental and theoretical skillset portfolio, as proven by the long list of projects in which she has got involved and developed.

**Resumen del Currículum Vitae:**

After graduating in Chemistry from Universitat Rovira i Virgili (URV, Tarragona, Spain) in 2013, I completed the Master degree program Master in Synthesis, Catalysis and Molecular Design (URV-ICIQ) in 2014. Later on, I defended my Ph.D. thesis with European Mention at the URV, under the supervision of Profs Diéguez and Pàmies (2018), which was awarded with the Extraordinary Doctorate Award. My research during this time was focused on the development of modular ligand libraries to be used in important metal-catalyzed asymmetric reactions. During my PhD, I initially did a short stay with Prof. Norrby (AstraZeneca) in DFT studies that were key to achieved a dual training in catalysis, experimental and computational. This stage resulted in a collaboration with 4 joint publications. I also did a four months exchange in the group of Prof. Alcarazo (Göttingen University), where I worked in the synthesis of novel chiral cationic phosphonite-pyridine ligands. The research performed during my PhD resulted in 17 publications. Since Nov. 2018 to Jul. 2019 I was assistant professor at URV (co-directing two Master's projects) before moved to Sweden to work as post-doctoral researcher in Stockholm University, joining the groups of Profs. Szabó (organic synthesis) and Himo (quantum chemical modelling). This postdoctoral stage allowed me to expand my dual training, working on the development of asymmetric organocatalyzed processes for the synthesis of relevant organofluorine molecules combining organic synthesis with DFT calculations.

In 2022, I rejoined Universitat Rovira i Virgili as a Juan de la Cierva-Incorporación postdoctoral fellow, to work in the group of Prof. Poblet (computational chemistry) to contribute in the development of new catalysts for the water oxidation reaction on the basis of DFT-calculations. My involvement extends to both aspects, computational and experimental, allowing me to work within an interdisciplinary environment. During this period, I also stablished a strong collaboration with Prof. Diéguez's group (organometallic chemistry), working on the development of new ligand libraries for asymmetric metal-catalyzed reactions of industrial interest. From this collaboration also arise the co-direction of two Ph.D. students and 4 Master's projects.

As an early-career researcher, I have an exceptional publication track record with: 29 research articles (of them 2 as corresponding author, 17 as first author, 8 as second author and 2 as third and fifth author, respectively) in international peer-reviewed journals, 3 book chapter (of them 2 as corresponding author), 1 patent (in preparation in collaboration with Bayer AG) and 13 contributions to national and international conferences. My research has been published in prestigious and high impact journals highlighting J. Am. Chem. Soc., Angew. Chem. Int. Ed. and ACS Catal.

In terms of internationalization and project leadership, I have attained 32 months of international research experience. In the last years, I have been invited to write a review and a book chapter. Additionally, I have been also invited as editor of a book for Advances in Catalysis, to establish a book entitled Computational Insights into Catalytic Transformations. I took a pivotal role in the organization of the 1st Meeting of Inorganic and Organometallic Chemistry of the Catalan Chemical Society (1RQIO-SCQ).

**Resumen de la Memoria:**

After obtaining my MSc degree in Nanoscience (2014) from Aarhus University (AU), Denmark, I was employed as a Research Assistant (2014-2015) in the group of Prof. Bo B. Iversen at Chemistry, AU, within the international project "Center for Thermoelectric Energy Conversion (CTEC)". I worked with the start-up company TEGnology, where I was responsible for developing a protocol for synthesis and SPS sintering of thermoelectric materials, including optimization of their structural stability and thermoelectric performance.

I did my PhD (2015-2018) at iNANO, AU, (Supervisor: Prof. M. Christensen) funded by the international project "Green Chemistry for Advanced Materials (GCAM)". I investigated the nucleation mechanisms and crystallization dynamics of nanoparticles using in situ synchrotron X-ray scattering techniques, and I was involved in projects related to nanostructuring of magnetic materials. My Ph.D. involved a Scientific Stay (2016) in the labs of Prof. N. Sharma UNSW, Sydney, Australia, investigating the structure and electrochemical properties of $Sc/Al_2(W/MnO_4)_3$. Notably, my thesis was awarded the DanScatt PhD prize 2019 for best thesis from the Danish Association of Crystallographers. Following my PhD, I was employed for 1 year as a Postdoc (2018-2019) at iNANO, AU, investigating nanostructured magnets as part of international projects (GCAM and AMPHIBIAN).

Since 2019, I have been the Principal Investigator of 3 consecutive research projects, being continuously funded by these independent grants. In 2018, I was awarded a prestigious independent Carlsberg Foundation Internationalisation Fellowship (2019-2021), which I took up at the School of Chemistry, UNSW, Sydney, Australia. Here, I initiated my work as an independent researcher studying transition metal oxides for Li- and Na-ion batteries using operando neutron and synchrotron diffraction. In 2022, I returned to Europe with a 2-year Maria Zambrano Fellowship (2022-2023) at Facultad de Ciencias Físicas, UCM, Spain, and recently, I was incorporated at ICMM-CSIC, Spain, with a Marie Skłodowska-Curie Individual Fellowship (2023-2025). Here, I continue my work on cathode materials for Li-ion batteries studying their formation and structure using diffraction and total scattering methods.

My ambition is to lead my own research lab and program, where I will address key challenges for state-of-the-art electrochemical energy storage materials. In this context, the proposed RyC project is designed to leverage my expertise in detailed (in situ, ex situ, operando, post mortem) structural analysis of functional materials by neutron and synchrotron diffraction and total scattering (with pair distribution function analysis) techniques to provide new insights and progress in the field of solid-state batteries (SSBs). I intend to separately examine (1) high-energy oxygen redox active LLO cathode materials and (2) nanostructured metal halide ionic condutors for solid state electrolytes (SSEs) and obtain a full mechanistic understanding of their individual synthesis-structure-property relationships. Subsequently, I will investigate (3) the compatibility of the LLOs and metal halide SSEs in catholyte composites, and their performance in next-generation SSB devices.

**Resumen del Currículum Vitae:**

PhD in Nanoscience (14/06/2018) from Aarhus University, Denmark. Currently, employed as a Marie Skłodowska-Curie Fellow at Instituto de Ciencia de Materiales de Madrid (ICMM), CSIC, Spain. Previously carried out 4 postdocs (2018-present) at 4 different research centres, 3 of which have been self-funded through individual research grants.

Participation in 9 research projects (4 work team, 5 research team – 3 Principal Investigator), of which 6 were international (3 EU projects, 2 consortiums with industry partners). Winner of 4 independent research grants (Total research grant support won: 535.630 €, incl. declined MSCA COFUND).

Author of 31 articles (3 reviews) in peer-reviewed indexed scientific journals, with the majority being in high-impact leading journals in the corresponding fields (D1=58%, Q1=90%). First author of 10 (D1=70%, Q1=100%) and corresponding author of 4 (D1=75%, Q1=100%). The publications have gathered a total of 669 citations (H-index=15). I am also author of 1 open access book chapter; Ceramic Materials - Present and Future, Intech Open, 2023. I frequently act as a reviewer for journals e.g. Inorganic Chemistry, J. Phys. Chem. C, ACS Energy Letters and ACS Nano.

Author of 55 contributions to conferences/workshops/meetings (19 national, 36 international), including 39 posters (19 as presenting author) and 16 oral presentations (11 as presenting author). In addition, I have given 6 invited seminars at universities and research centers. Notably, I received the Young Scientist Poster Award at the European Powder Diffraction Conference 2018 and the prize for Best Presentation at the 2017 iNANO Autumn School.

Participation in 37 experimental beamtimes (3 as PI, 17 as co-PI) and >150 days (10 as PI, 62 as co-PI) employing diffraction, scattering and absorption instruments at synchrotron light sources (MAX-II, PETRA III, ESRF, Australian Synchrotron, ALBA) and neutron spallation (PSI) and reactor (ANSTO, ILL) sources. I have obtained beamtime as PI/co-PI with an estimated value of 1.188.000 € (PI: 165.000 €, co-PI: 1.023.000 €) according to ESRF data (~16.500 €/day) through competitive calls. In total, 86% of my published research articles are based on data from experiments at large-scale radiation facilities.

Co-supervised 3 BSc (J. Ahlburg, 2013; A. Eikeland, 2014; A. Nielsen, 2019), 2 MSc projects (J. Hoelscher, 2017; N. Vichairat, 2017) and 2 PhD projects (J. Liu, 2020; J. Hoelscher, 2021; non-official due to length of contract) at AU, Denmark (2014-2019) and at UNSW, Australia (2019-2021). In addition, I have supervised 2 TFG projects (A. Ortega, 2023; Y. Grohmann, 2023) at the Faculty of Physics, UCM, Spain.

Conducted a total of 666 hours of teaching in undergraduate, graduate and PhD level courses at the Dept. of Chemistry (560 hours) and iNANO (70 hours), AU, Denmark, and Faculty of Physics (36 hours), UCM, Spain.

Academic Tutor for Visitors' Service at the Dept. of Chemistry, AU, arranging and tutoring fun and engaging popular science events for public visitors. Supervision of visiting high school students and SSP projects (5 high school project students). First author of article published in Danish popular science magazine Aktuel Naturvidenskab: Nanomagneter – Størrelsen betyder noget, H. L. Andersen, A. Mortensen and M. Christensen, Aktuel Naturvidenskab, 2014, 4, 14-19.

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| **Área Temática:** | Ciencias y tecnologías químicas |
| **Nombre:** | FUENTES DOMÍNGUEZ, Mª ANGELES |
| **Referencia:** | RYC2023-042945-I |
| **Correo Electrónico:** | mangeles.fuentes@dqcm.uhu.es |
| **Título:** | Earth-Abundant Bimetallic Catalysis for Sustainable Transformations |

**Resumen de la Memoria:**

The research focus of Dra. Fuentes intertwines the organometallic chemistry of transition and main group metals, catalysis, and synthesis. Awarded the prestigious FPI fellowship in 2009 at the University of Huelva (UHU), she embarked on PhD research focused on group 11 metals for homogeneous catalysis, culminating in a Summa Cum Laude International PhD in 2013. A significant early milestone was her PhD international stay at the University of Strathclyde, where she developed metal-mediated cascade activation of N-heterocycles.

Her postdoctoral journey commenced at the UHU, merging into a postdoctoral collaboration with the industry Atlantic Copper. Next, she started a new international postdoctoral stage at the University Strathclyde (2014-2017), where she had the opportunity to take the lead and developed her own research line on C–H bond metallation chemistry. In 2017, she transitioned to the University of Oxford, delving into frustrated Lewis chemistry for small molecule activation (2 years). This period marked her collaboration with the international industrial SCG Chemicals Ltd., one of the largest petrochemical industries in Asia, at The SCG-Oxford Centre of Excellence in Chemistry, reflecting her ability to merge academic and industrial research. In 2018, she also developed postdoctoral research at the Leibniz Institute for Catalysis (LIKAT) in Germany further expanded her repertoire, focusing on xanthene-based ligands synthesis.

Returning to Spain in 2019 under the "Juan de la Cierva-Incorporación" program at the UHU, she ventured into transition metal catalysis. After this Juan de la Cierva position at the UHU, she steered towards an independent research line, crafting a niche in transforming CO2 into value-added products like carboxylic acids and carbonates, using Earth-abundant bimetallics, a testament to her foresight in addressing environmental sustainability. She has received various research awards; to highlight, her 2019 Andalusian Young Award in Science, Innovation, and University mirrors her research impact.

Her I3 certification in 2022 signals her research excellence.

Dra. Fuentes's almost 14-year career progression is also highlighted with 34 publications (+ 2 recent submissions), predominantly in multidisciplinary journals, 8 lectures, 21 poster presentations, and roles in 8 research projects including IP in 1 project in Spain. Her research is also characterised by international collaborations with a high degree of mentorship spanning 2 undergraduates, 5 masters, and 4 Ph.D. students. Currently, she is co-supervising 1 PhD thesis and 1 master student at the UHU.

Envisioning a new chapter, Dra. Fuentes's independent research will leverage her broad experience to pioneer Earth-Abundant Bimetallic Catalysis for Sustainable Transformations. This line aims to revolutionize CO2 utilization by implementing innovative catalytic approaches. Her trajectory, marked by high mobility (4 groups/universities), success in securing funding at every stage of his career through fellowships/grants and competitive research contracts, and with the industry, established collaborations, top-tier scientific production and supervision of students, demonstrate her leadership, independent thinking, and underpins her readiness for a thriving independent.

This application aims to start an independent career under the umbrella of the RyC Programme.

**Resumen del Currículum Vitae:**

In 2009, Dra. Fuentes jointed Prof. P.J. Pérez' s group of organometallic chemistry and homogeneous catalysis at University of Huelva (UHU) under the umbrella of a prestigious FPI Fellowship to carry out a PhD degree working on organometallic chemistry of group 11 metals for catalytic activation and functionalization of alkanes. In July 2013, she received the International PhD awarded Summa Cum Laude by Unanimity. During this period, she did a predoctoral stay at the University of Strathclyde (Glasgow, UK) in the group of Prof. E. Hevia studying mixed-metal-mediated cascade activation of N-heterocyclic molecules (4 months). After a short postdoctoral period with Prof. P.J. Pérez, she moved to the University of Strathclyde (Glasgow, UK) to work with Prof. R.E. Mulvey after getting a competitive postdoctoral research position, 2014-2017. She worked on the synthesis and reactivity of main group organometallic chemistry.

By 2017, she secured a highly competitive postdoctoral research assistant position at the University of Oxford, where she worked with Prof. S. Aldridge. Here, her research pivoted towards main group chemistry and the use of frustrated Lewis pairs for small molecule activation, fostering a strong collaboration with industry in Oxford, SCG Chemicals Ltd (one of the major petrochemical companies in Asia). Also, in 2018, she did postdoctoral research in Leibniz Institute for Catalysis (LIKAT) as part of a collaboration between Oxford (UK)-Rostock (Germany).

Returning to Spain in 2019 with a prestigious "Juan de la Cierva - Incorporación" research contract at the UHU, Dra. Fuentes solidified her leadership and independence in research. Her professional acumen was further recognized in 2022 with the I3 certificate. Currently, she is developing her independent research line at the UHU.

She has been involved in several areas of research (transition metal chemistry, main group chemistry, catalysis, synthesis), showing cross-disciplinary scientific formation. She has worked in 5 research groups, 4 international universities (UK, Germany) and helped in co-supervising 4 PhD and 4 master students previously in UK. She supervised 2 undergraduate final year projects (TFG) and 1 final year master thesis (TFM) at University of Huelva. Currently, she is co-supervising 1 PhD Thesis at the UHU.

She has been productive at every stage of her career. So far, she has published 34 publications (+2 recent submissions) and 1 book chapter. International collaborations have been a key aspect of Dra. Fuentes's career, resulting in 7 joint publications. She's also engaged in collaborations with petrochemical industries (Atlantic Copper and CEPSA in Spain and SCG chemicals Ltd in UK-Thailand). She participated in research projects (UK and Spain) and given 8 talks and 21 poster communications in national and international conferences.

A member of several prestigious chemistry societies, she served on the organizing committee of the Organometallic and Main Group Seminar Series at the University of Oxford, UK. Her work has earned her several awards, including the "2019 Andalucia Young Award in Science, Innovation and University".

She has demonstrated excellence during his career progression through his scientific achievements, mentoring and supervising experience, and by itself testifies to his capacity to be an independent research leader.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | VAN GASTEL , JAN JORIS |
| **Referencia:** | RYC2023-042859-I |
| **Correo Electrónico:** | jj.van.gastel@gmail.com |
| **Título:** | Historia del arte moderno |

**Resumen de la Memoria:**

Due to my diverse academic experiences, I have developed a decidedly international and interdisciplinary profile. Already in my PhD thesis, written at Leiden University and published in 2013 as "Il marmo spirante: Sculpture and Experience in Seventeenth-Century Rome", I have drawn on my double background in art history and psychology, involving literary studies as well. Since then, I have continued working particularly on early modern Italian art. With publications on artists such as Gian Lorenzo Bernini, Guido Reni, Jusepe de Ribera, and topics including Neapolitan still-life painting and the uses of different artistic materials in Naples and Lecce, I have developed a broad expertise in the art of early modern Italy, with further focal points in Spain and the Iberian World as well as in the Netherlandish art of the so-called "golden age". Decisive methodological perspectives include the perception of art (reception aesthetics), the role of the body and questions of embodiment in the production and perception of art, as well as a focus on materials and materiality. In my habilitation and second book project, forthcoming with Brepols this year, I have sought to develop an alternative account of the oft-neglected art of baroque Naples, departing from the overt materiality of its artistic expression. By focusing on materials – stones, textiles, wood, precious metals – and the intertwining of materiality with questions of identity, the project ties in with recent developments in the environmental humanities and confronts elements of the history of art and architecture with the histories of religion, science, and collecting. Moreover, the project has a strong historiographical component, dealing with questions regarding center and periphery and the geography of art. My interest in the history of art history is reflected in another important project as well. In 2021, I received a generous grant from the Swiss National Science Foundation for the project "Heinrich Wölfflin: Collected Works", which I am currently directing together with Oskar Bätschmann and Tristan Weddigen. In this context and also drawing on earlier research, I recently been working on a research project on early modern sculpture. Building on a significant historiographical component and exploring a wide range of examples, the project understands sculpture's mediality particularly by probing its relationship with other media as well as with the human body, understood as a medium in itself.

**Resumen del Currículum Vitae:**

Currently, I am assistant professor ("Assistenzprofessor", fixed-term) for the history of early modern art at the University of Zurich. I have studied Psychology and Art History at the VU University Amsterdam and the Università Ca' Foscari, Venice, completing both studies with merits. After fellowships at the Dutch Institutes in Florence (NIKI) and Rome (KNIR), I gained a position as PhD fellow in the interdisciplinary research project "Art, Agency and Living Presence in Early Modern Italy" funded by the Dutch Research Council, based at Leiden University and directed by Prof. Caroline van Eck (Cambridge). In the context of this project, I wrote my PhD thesis "Il Marmo Spirante: Sculpture and Experience in Seventeenth-Century Rome", which was published with Akademie Verlag in 2013 in the book series of the Warburg-Haus in Hamburg. In addition to further short-term fellowships in Florence and Rome, as well as at the Fondazione Ermitage Italia in Ferrara and the Bode Museum Berlin, I was research fellow at the research group "Picture Act and Embodiment", funded by the German Research Foundation and directed by Prof. Horst Bredekamp at the Humboldt University, Berlin, at the University of Warwick, and was part of the research group "Images of Nature", funded by the Humboldt Foundation, based at Hamburg University and directed by Prof. Frank Fehrenbach (previously Harvard). Before coming to Zurich in 2018, I had a position as senior postdoctoral research assistant at the Bibliotheca Hertziana – Max-Planck-Institute for Art History in Rome. I am currently principal investigator of the project "Heinrich Wölfflin: Collected Works", granted by the Swiss National Science Foundation (1,3 mio. EUR). Throughout my academic career I have published close to sixty publications, among which one monograph (a second is in press), six edited volumes (two further are in press), thirteen articles in scholarly journals, twenty-four essays in edited volumes, and eight book reviews. Moreover, I have presented my work at over seventy international conferences and workshops, in a large range of European and North American countries.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | VAN TONGEREN , CARLOS |
| **Referencia:** | RYC2023-043391-I |
| **Correo Electrónico:** | carlos.vantongeren@manchester.ac.uk |
| **Título:** | Carlos van Tongeren - Research trajectory |

**Resumen de la Memoria:**

My research deals with cultural memory in Spain and Latin America, with a focus on the way in which various artistic media —especially literature, film, performance art and music—have been used to reflect on the legacies of dictatorial violence since the second half of the twentieth century. In 2015, I completed my PhD on detective fiction in Spain, Mexico and Cuba, focusing on three authors whose work uses comical devices (irony, humour, cynicism) to reflect on the legacies of dictatorial violence and the disenchantments of post-totalitarian transitions on both sides of the Atlantic. The outputs of this research include my first academic monograph, published with Brill-Rodopi in 2019, as well as various peer-reviewed journal articles.

Since my appointment as a lecturer in Spanish Cultural Studies at the University of Manchester in September 2018 (with tenure from June 2021; promoted to Senior Lecturer in August 2023) I have developed a more interdisciplinary framework for the analysis of cultural memory in relation to questions of agency and positionality. Focusing on performances of memory in flamenco, my research moves beyond clear-cut ideological oppositions between hegemonic memory and counter-memory in existing debates about memory in post-Franco Spain. Instead, my research shows that flamenco is a dynamic and highly ambivalent field where artists and broader collectives constantly negotiate between dominant and subalternised positions to make sense of a complex past. Combining theories and methods from cultural studies, performance studies and musicology, I examine how the voices, experiences and memories of flamenco artists have been mediated by intellectuals, writers, filmmakers, and other artists with different levels of proximity to flamenco communities themselves. To date, I have published three peer-reviewed journal articles and one book chapter about this topic.

I am currently also completing my second and third single-authored monographs about the relations between flamenco, memory and heritage in post-Franco Spain. My second monograph, entitled 'Rhythm and Heritage in Modern Flamenco Guitar' is under contract with Cambridge University Press; it successfully underwent peer-review between July-October 2023 and I will submit the final manuscript by March 2024. For my third monograph, provisionally entitled 'Flamenco After Franco: Performances of Memory in the Spanish Transition', I have completed drafts of three out of five book chapters. I aim to submit this manuscript to the University of Toronto Press (Toronto Iberic book series) by July 2025.

While I aim to continue my research on flamenco in future years, I wish to further enhance my interdisciplinary profile in my next research project, which engages with the pressing social, cultural and educational challenges of the climate emergency. For this new research, I will build on my previous research on cultural memory and cultural transitions, to examine the roles of art and artivism in Spain and Latin America in unpacking the violent legacies of extractivism (mining and other forms of resource extraction, hydroelectric projects, industrial agriculture, etc.) and in imagining post-extractivist futures.

**Resumen del Currículum Vitae:**

I completed my PhD in Spanish and Latin American Literature at Radboud University, the Netherlands, in November 2015. Since then, I have worked as an Assistant Professor in Hispanic Studies at Radboud University (2016-2018) and a Lecturer (2018-2023, with tenure from 2021) and Senior Lecturer (2023-present) in Spanish Cultural Studies at the University of Manchester. During these appointments, I have gained broad work experience in all areas of academic activity (research, teaching, and academic service).

To date, I have published one single-authored monograph and ten peer-reviewed journal articles on the literatures and cultures of Spain and Latin America. I have also co-edited one peer-reviewed book publication about irony and violence in Latin American literature, and I have published five academic book chapters. I have delivered three invited talks at departmental research seminars at institutions such as Cambridge University and the Universidad Complutense de Madrid; I have co-organised two international conferences and have presented 15 international conference papers.

The main focus of my research has been on cultural memory and the way in which various artistic media —especially literature, film, performance art and music—have engaged with the legacies of dictatorial violence in Spain and Latin America since the second half of the twentieth century. I study cultural memory alongside questions of agency and positionality, examining how discursive and performative expressions of memory involve negotiations between a variety of narratives, ideological viewpoints, and dominant and subaltern positions. In two peer-reviewed articles about flamenco, I have contributed new understandings on the relations between urbanisation and systemic violence in Francoist Spain (1939-1975) and I have published pioneering research on the impact of these violent legacies on the flamenco community and their artistic repertoire. My recent work has becoming increasingly interdisciplinary and builds on theories and methods from various disciplinary fields, especially literary and cultural studies, performance studies, and musicology.

I have been successful in international grant capture and have had a leading role in international and collaborative research projects. Between 2021 and 2023, I was the Principal Investigator of a Research Networking Grant on flamenco and memory (£44,621), funded by the Arts and Humanities Research Council, UK. In 2022, I also led an interdisciplinary project on right-wing environmental populism (£19,612), with funding from the University of Manchester's Interdisciplinary Research Recovery Fund.

I have collaborated widely with cultural institutions and festivals to present my research on flamenco to international audiences, thus contributing to public debates about the historical, cultural, and political backgrounds of this art form. I have further contributed to public debate, inclusion, and outreach by the creation of diverse sets of open-access materials.

I am the main supervisor of one PhD student at the University of Manchester working on flamenco in marginalised urban areas. I am external examiner for one PhD student at the University of Kent (thesis defence date [viva] on 13 March 2024) and have been the main supervisor of two MA theses to date.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | ARBOLEDA GÁMEZ, PABLO |
| **Referencia:** | RYC2023-044646-I |
| **Correo Electrónico:** | p_arboleda@hotmail.com |
| **Título:** | Ruins of modernity & urban peripheries, critical heritage, and art-based research |

**Resumen de la Memoria:**

With an international education and working history spanning architecture, heritage, visual arts, and interdisciplinary cultural studies and fields, my research tackles the multifaceted dimensions of modern ruins and urban peripheries in post-industrial and post-crises scenarios, with a focus on creative re-appropriation. I graduated as an architect in the School of Architecture of Granada (Spain, 2011), obtained a Master's degree in World Heritage Studies at Brandenburg University of Technology-Cottbus (Germany, 2014), and I have a PhD in European Urban Studies from Bauhaus University Weimar (Germany, 2017). I worked as a postdoctoral researcher both at the School of Geography of the University of Glasgow (UK, 2018-2021), and in the Department of Humanities: History, Geography and Art at University Carlos III Madrid (Spain, 2021-2022). I was granted a Juan de la Cierva-Incorporación (2022-2024) to be enjoyed at CSIC, having first worked at the Institute of Heritage Sciences, and then at the Institute of Language, Literature, and Anthropology (ILLA). The latter is the institution where I am currently based, developing, since February 2024, an Atracción de Talento-Community of Madrid project.

My profile has grown alongside a renewed, global interest in modern ruins as sites that offer alternative readings of contemporaneity and progress. My research examines ruination not merely as a problem to correct but as a complex cultural reality to comprehend, and thus, I go far beyond the formal rehabilitation of decaying buildings as the only possible solution to deal with heritage. This is relevant in a context where the notion of heritage is no longer exclusively tied to monumentality, beauty, and power, and is rather emerging as a critical field that explores broader contested issues. Drawing from the tension between the controversial meaning of abandoned architectures and their artistic and performative potential, my work opens a series of critical heritage debates centring on urban peripheries, participatory place-making, alternative conservation, and counter-aesthetics reclaimed; thus, my line of research is framed into the increasing discussions on how contemporary practices and spaces originate new heritage forms whose meanings are constantly shaped and negotiated.

Building from international site-specific studies, theoretically informed commentaries, experimental collaborations, walking methods, and art-based research, my strong record of peer-reviewed publications and international conference presentations goes beyond the academia. My work's idiosyncrasy – centred in heritage participation and empowerment – fosters knowledge exchange via exploratory dialogues and constant interaction with artists and activists, and consequently, my outcomes are relevant and beneficial to local communities. Supplemented by photo-essays, photo-comics, experimental videos, poems, videopoems and further creative outputs, the originality of my contributions allows me to build bridges with the general public – something that is also evidenced by my organisation and participation in activities like open symposia, capacity-building events, workshops, and art exhibitions. Aligned with this, I am committed to Open Science, and I engage in regular collaborations with different mass media to make my research findings fully accessible and transparent.

**Resumen del Currículum Vitae:**

My reputation is built on a record of peer-reviewed publications through which I have built status across the humanities and arts. I have published 26 contributions, including 1 monograph, 11 articles in SJR Q1 journals, 2 articles in SJR Q2 journals, and 4 book chapters in edited volumes by Routledge and Springer; I have also delivered a total of 38 national and international conference presentations and guest talks. Since my work involves the study of art collectives, heritage activists, and ethical entrepreneurs – affording knowledge exchange – I have been invited to present at open events with audiences of more than 100 people, whilst my work's empirical materials have been part of photography and video exhibitions. Further, my findings have been disseminated in the Spanish mainstream media, including radio interviews for RNE and Onda Cero, and press releases published in El País and further newspapers.

I have accumulated more than 10 years of educational training and work experience abroad. Still as an architecture student, I participated in workshops at the University of Los Andes in Colombia (2007, 1 month) and at the University San Francisco de Quito in Ecuador (2009, 2 weeks); also, I was an exchange student in the School of Architecture of Marseille in France (2007-2008, 9 months), and in the Department of Visual Arts of the University of Ottawa in Canada (2008-2009, 9 months) – after graduating, I worked as an intern at the UN Headquarters in New York (2012, 3 months). In Germany, I completed a Master at Brandenburg University Cottbus (2012-2014), and in this country I also obtained my PhD from Bauhaus University Weimar (2014-2017) – during said timeframe, I was a visiting researcher at the Grupo de Investigación Paisaje Cultural based in the School of Architecture of the Polytechnic University of Madrid (2015-2016, 8 months), and at the Centre for Human and Social Sciences within the CSIC (2016-2017, 4 months). As a postdoc, I have worked at the University of Glasgow (2018-2021) – including a stay at the Centre for Art and Urbanistics 'ZK/U' in Berlin (2019, 3 months) – and back in Spain, at the University Carlos III (2021-2022) and at CSIC, first in the Institute of Heritage Sciences, and in the Institute of Language, Literature and Anthropology, where I am currently based.

At present, I am the PI of an Atracción de Talento project, being this the most recent of a total of 5 projects and grants where I acted as the PI and for which I secured nearly €850,000 – including Juan de la Cierva-Incorporación, and the prestigious Urban Studies Foundation Grant. Also now, I am part of the research team within 2 R&D projects, and in the past, I worked as an Assistant in a Teaching Innovation Project. I have taught undergraduate and master's courses in national and international universities, I supervised 4 undergraduate dissertations, and I examined 13 undergraduate dissertations, 3 master's theses, and wrote the expert evaluation report for 1 PhD thesis; moreover, I have peer reviewed a total of 10 articles for top journals. I have organised multiple knowledge transfer events, including a contracted 3-month workshop at the cultural centre Matadero-Madrid, I am

one of the founders of the Laboratorio de Experimentación Etnográfica para la Transformación Social (LE2TRAS-CSIC), and in 2020 I took a parental leave of few months.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Cultura: filología, literatura y arte
**Nombre:** CÁCERES PIÑUEL, MARÍA
**Referencia:** RYC2023-043283-I
**Correo Electrónico:** caceres.maria@gmail.com
**Título:** Internacional, interdisciplinaria y con liderazgo

**Resumen de la Memoria:**

My main field is musicology, but my scholarly interests range widely, from the History of ideas to Cultural Studies. My three lines of specialization are 1) Historiography of music and musicology (18th to 20th centuries), 2) Early music revival processes (19th-20th centuries), and 3) Gender and Economies of music. Thanks to my interdisciplinary background, acquired during my graduate, postgraduate, and post-doctoral training, I am used to adapting my performance, communication, and academic writing to diverse linguistic and intellectual traditions.

I have an Excellent International Profile and a well-established career in Spain and Switzerland. I have presented my research at 37 international scientific meetings and participated as an invited speaker in 14 scientific events. I have collaborated on various research projects and groups based in Switzerland, Germany, Austria, Italy, France, Spain, and the USA. I have enjoyed 16 funded research stays in top-leading institutions, in France (U. Sorbonne), Spain (UAB, UAM, CEC, U. Zaragoza), the UK (U. Cambridge), Switzerland (U. Bern), Austria (U.Vienna), and the USA (U. Georgia). Due to my academic mobility funded by 16  highly competitive fellowships and grants, I have built a wide international research network, being a member of 9 scientific professional associations, that has permitted me to launch some initiatives of inter-institutional collaboration. I have experience organizing R&D activities convening and managing 11 scientific events held in Spain, Japan, Greece, Switzerland, UK, and Austria.

I have experience leading international research activities as well as reaching and managing third-party funding: I am the founder and co-leader of a research group depending of the International Musicological Society (Musical Patronage and Gender, 2020-), I have been PI, along with Vincenzina Ottomano, of a competitive funded interdisciplinary research project Women and Musical Patronage: from the French Revolution to World War II (Univ. of Bern,2019-2023). As part of my tasks as co-PI of this last project, I have obtained more than 35.113 EUR of third-party funding. In addition, I am the co-founder of a German Musicological Society study group specializing in German-Iberian-American musical relations and I was the team coordinator of a Swiss National Science interdicisplinary project (2015-2019) of more than 665.526 EUR budget.

I have published in top-leading peer-reviewed scientific journals, including Musicologica Austriaca and Revista de Musicología and publishing houses. Reichenberger published my monograph on José Subirá and the cultural and intellectual history of musicology in Spain (2018). I have edited 2 special issues for the peer-reviewed journals Artigrama (Movilidad, internacionalización y espacios de música, 2021) and Astorica (Evaristo Fernández Blanco. Un músico rescatado, 2015). In addition, I have edited 2 peer-reviewed edited books for Peter Lang (Branding "Western Music", 2023) and Routledge (Gender, Patronage, and Cultural Transfers during the "Long 19th Century": Women as Patrons, forthcoming 2024). I have considerable experience in outreach activities: I have written 4 concert program notes, lectured at 6 concert conferences, and 3 science dissemination events in Spain and Switzerland. Since 2018 I am typewriter and broadcaster of the radio program Enlazados (RadioBern)

**Resumen del Currículum Vitae:**

I started my Ph.D. thanks to a competitive FPU  (Formación del Profesorado Universitario) fellowship (2008-2012) depending on the Spanish Ministry of Science at the University of Zaragoza. My PhD project was devoted to the impact of José Subirá in the history of musicology in Spain. As part of my doctoral training (FPU at the Univ. of Zaragoza), I coordinated two symposia. I also benefited from two research fellowships in Switzerland (Univ. of Bern) and in the United Kingdom (Wolfson College, Univ. of Cambridge).

After completing my PhD, I drafted a seed post-doctoral project and I was elected to participate in the Balzan Musicology Project Towards a Global History of Music led by Professor Reinhard Strohm (University of Oxford). Supported by this Balzan project, I acquired a visiting fellowship at the University of Vienna and I convened an
international workshop at the Austrian Society of Music in Vienna.

In 2015 I co-wrote the application for an interdisciplinary research project for the Swiss National Science Foundation (SNSF). From 2015 to 2019 I was a contracted postdoc and team coordinator of the SNSF-Funded Project: The Emergence of 20th Century " Musical Experience" at the University of Bern. In order to undertake archival research, I enjoyed a research sojourn at the Univ. of Georgia (USA) in 2018.

From 2019 to 2020 I was Marcel Bataillon Fellow at the Madrid Institute of Advanced Study-Casa Velázquez.

From 2019 to 2023 I have been PI, along with Vincenzina Ottomano, of a competitively funded inter-facultative research project (Women and Patronage: from French Revolution to World War II) at the University of Bern. During this period I lectured a seminar, convened an international workshop, and was elected associate researcher of the university.

Since May 2022 and until April 2024 I am a María Zambrano fellow (Atracción de Talento Internacional) at the University Autonoma of Barcelona. During this period I lectured (Master's level), edited and published an edited book (forthcoming 2024), and I have been invited to be a member of three research projects in Spain, France, and Italy. I have also convened an international event (2022) and published two dissemination articles (2023 and 2024).

I am a manuscript reviewer of 6 journals, including the most-rated journal in musicology -Acta Musicologica-, an external assessment expert for 2 scientific bodies (European Union and Agència Valenciana d'Evaluació i Prospectiva), and jury of the Lothar Siemens Musicological Award (2023). I have been a Ph.D. committee member of 2 Ph.D. defenses (U. Salamanca) and I have co-supervised 2 Ph.D. thesis and an MA thesis at the University of Bern, an MA thesis at UAB, and I am currently supervising a Ph.D. thesis at the University Autonoma of Barcelona.

I have lectured as a contracted professor at BA and MA levels at the University of Zaragoza (2010-2012), the University of Bern (2017 and 2019), and the University Autónoma of Barcelona (2022-2023), and as an invited professor at the University of Bonn (2019), the University of Hamburg (2020), the Univesrity Complutense of Madrid (2021), the University Autonoma of Madrid (2019), the Valencia International University (2021 and 2022), the University Ca' Foscari of Venice (2020 and 2021), the University of Aveiro (2019), and the University Michoacana of San Nicolás de Hidalgo (2021).

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | CONTRERAS ZUBILLAGA, IGOR |
| **Referencia:** | RYC2023-043728-I |
| **Correo Electrónico:** | contrerasigor@gmail.com |
| **Título:** | Music and Politics in 20th and 21st Century Spain |

**Resumen de la Memoria:**

My research centres on exploring the intersections between music and politics in 20th-century Spain. In my doctoral thesis, I delved into the Spanish musical avant-garde during Franco's dictatorship. Through meticulous research, I demonstrate that from the late 1950s, representatives of the Spanish musical avant-garde were active under Franco's successive governments. This challenges the commonly accepted notion of a heroic musical avant-garde ignored and sometimes attacked by Franco's dictatorship. Broadening the scope, I use the Spanish musical avant-garde under Franco's dictatorship as a case study to show that not all dictatorial regimes were equally hostile to all forms of artistic avant-garde. Positioned at the crossroads of history and musicology, my study provides a fresh perspective on the cultural and political history of Francoism. Furthermore, it contributes to a broader reflection on the intertwining of music and politics, especially under dictatorial regimes.

I have spearheaded my own research initiatives focused on music-making during Franco's dictatorship within several national R&D projects. My investigations have covered three primary areas: 1) the musical exchanges between Spain and Portugal in the early years of Franco's dictatorship, 2) the propaganda music associated with the Francoist side during the Spanish Civil War, and 3) the involvement of Spanish avant-garde composers in prestigious European contemporary music festivals in the 1970s.

Establishing myself as a leading expert in music during the Franco regime, my subsequent research project explored the connections between music and democracy in the 'transition' period following the dictator's death. This ground-breaking study examines how music was employed to express visions of democracy and, more broadly, to participate in the social mobilization for liberty and equality in the final years of the dictatorship and its aftermath. As argued in my research, musicians in 1970s Spain, by drawing on democratic analogies for their practice, became active participants in the political debate, akin to politicians claiming the 'true' values of democracy or members of the public contesting those assertions with their own definitions. While making an original contribution to the study of the musical culture of post-Franco Spain, this research also engages with and advances questions currently explored in broader areas of scholarship. It aligns itself with the growing body of research focusing on the relationships between democracy and art-making, seeking to determine the extent to which the study of the latter might inform our understanding of the former.

I have recently embarked on a new research venture on music and social movements, with a specific emphasis on anti-NATO songs in Spain during the 1980s. My study demonstrates that these songs were characterized by a robust set of imaginaries resulting from the internalization and negotiation of historical episodes, such as the Spanish Civil War, Franco's dictatorship, and the subsequent democratization process, viewed through the prism of the Cold War. The research aims to contribute to understanding the socio-cultural dynamics during Spain's international transition between 1975 and 1986.

**Resumen del Currículum Vitae:**

I am a musicologist and cultural historian with a prominent international profile. My research career has extended across three countries: France, the UK, and Spain. I earned my Ph.D. in 'Musique, histoire, société' from the École des Hautes Études en Sciences Sociales in Paris, garnering a Jury's Special Mention at the 'Prix de Thèse Université PSL en Sciences humaines et sociales' in 2018. Following four years as a research fellow at the University of Huddersfield (UK), I am presently a member of the Department of Musicology at the UCM with a Juan de la Cierva-Incorporación contract. Due to my extensive international research background and proficiency in diverse scientific cultures, I excel at competently publishing in English, French, and Spanish. I authored a monograph on the Spanish musical avant-garde during Franco's dictatorship. My contributions also include articles in high-ranking journals in cultural studies and musicology, as well as book chapters in collective volumes on 20th-century Spanish music and culture published by reputed publishers.

I have presented my research findings at international conferences in the US, UK, Germany, France, Italy, and Spain. Additionally, I have served as a guest lecturer at research seminars in prestigious institutions, including the University of Glasgow, the University of Manchester, the University of Huddersfield, the University of York, and the UCM. I have also been a visiting scholar at Harvard University.

Throughout my research career, I have consistently provided substantial evidence of leadership. As a doctoral student, I organized several international conferences. I am also the founder of the journal 'Transposition. Musique et sciences sociales,' where I currently serve as a member of the scientific committee. Furthermore, I have showcased my leadership skills through active participation in diverse research projects. I served as the principal investigator at the University of Huddersfield for a research project on new music and democracy in post-Francoist Spain, funded by the prestigious British Academy. As part of this project, I organized the annual study days on 'Music and Democracy' and the International Conference 'Arts and Democracy in Post-Authoritarian Iberian Peninsula' at the University of Huddersfield. Previously, I have developed my own lines of research in three National R&D projects.

My leadership skills are further exemplified by my role as a co-editor for various collective volumes and themed journal issues. Another example of leadership is the extensive consultancy work I have undertaken. My expertise has been sought by prestigious journals in the UK, Switzerland, Chile, Costa Rica, Portugal, and Spain to act as a peer reviewer for articles on music and politics. I have also reviewed book proposals on this topic for Palgrave Macmillan and Genueve ediciones. Finally, I have reviewed research projects for the British Academy and the Swiss National Science Foundation.

My activity in France, Spain, and the United Kingdom has enabled me to build substantial international research networks that could result in collaborative projects on music and politics. I have already succeeded in grant capture, having been awarded £312,379 in individual grants in the UK. In my two years at the UCM, I have contributed to the training of young researchers by supervising research works.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | FERNÁNDEZ ALMOGUERA, ADRIÁN |
| **Referencia:** | RYC2023-042692-I |
| **Correo Electrónico:** | af.almoguera@gmail.com |
| **Título:** | Historia global de las relaciones entre los sistemas políticos revolucionarios y el pensamiento arquitectónico (1770-1840) |

**Resumen de la Memoria:**

Mi trayectoria investigadora se ha especializado en el estudio crítico de la construcción de idearios políticos y nacionales a través del campo arquitectónico y urbanístico en la época de las Revoluciones liberales (1770-1840). Gracias a diversas becas y contratos internacionales obtenidos en procesos competitivos, he desarrollado varios proyectos de investigación individuales que han definido un perfil marcado por el alto rendimiento, la internacionalización y la proyección. En este contexto, mis investigaciones se han sustentado en diversos pilares como el trabajo en instituciones científicas de prestigio, la transferencia de conocimiento a través de actividades como exposiciones temporales, la construcción de redes en torno proyectos y actividades científicas de carácter europeo, la publicación de textos de referencia, y la participación y organización de congresos y encuentros científicos de impacto. Este bagaje, marcado por la permanente movilidad internacional entre distintos sistemas académicos y científicos, me ha permitido desarrollar un marco de estudio temático general, en el que he definido distintos subtemas y líneas de investigación que confluyen en mi específico interés por los fenómenos de construcción nacional a través de procesos de interacción entre espacios urbanos desde una óptica interdisciplinar y global. Así, he delineado un perfil investigador especializado en amplias áreas geográficas, formado en el estudio de decenas de fondos archivísticos y patrimoniales europeos, y capaz de plantear líneas de investigación, hipótesis y problemáticas desde perspectivas de la historia global, aspectos que quiero potenciar en el futuro con una nueva fase de investigaciones centrada en las transferencias entre Europa y la América de las primeras independencias. En ese sentido, mi producción, que ha supuesto una revisión crítica desde parámetros internacionales a cuestiones en apariencia puramente nacionales, ha contribuido a renovar toda una corriente historiográfica y metodológica sobre la historia de la arquitectura española de esta época, una disciplina que se hallaba ausente en los últimos grandes estudios europeos en este campo. Además, las conferencias y comunicaciones impartidas, así como las decenas de publicaciones en libros en editoriales de alto impacto, revistas indexadas, y catálogos de exposición editados por instituciones de prestigio (la mayoría, en ámbito europeo), han introducido en la reflexión colectiva española sobre estas problemáticas nuevos planteamientos teóricos y metodológicos adquiridos a lo largo de mi paso por sistemas e instituciones de diversos países. Por otro lado, más allá de la coordinación de publicaciones y congresos, mi liderazgo científico ha contribuido al establecimiento de líneas de investigación e hipótesis científicas originales y sólidas, reconocidas en diversos ámbitos académicos y científicos, que siempre han enriquecido y ampliado la producción y los intereses de las instituciones en las que he trabajado. Esta trayectoria ha configurado un perfil que ha evolucionado de manera independiente y coherente, con intereses y planteamientos originales y ambiciosos, hasta consolidar un espacio proprio en la red de investigadores sobre mis campos de estudio a nivel europeo.

**Resumen del Currículum Vitae:**

A partir de la obtención de una beca competitiva para la realización de un master en investigación en la Universidad Sorbona de París (2013-2014), desarrollé una fase de investigación predoctoral en dicha institución, en la que impartí clases durante tres años (2016-2019). Tras estas experiencias, mi currículum se ha construido sobre la base de distintas becas y contratos de investigación otorgados en convocatorias competitivas por diversas instituciones de gran prestigio como l' École française de Rome y la Universidad de Harvard, lo que me ha permitido consolidar una trayectoria postdoctoral internacional culminada con la obtención de un contrato Juan de la Cierva-Formación en 2023. Durante una década, mi carrera se ha desarrollado prevalentemente en ámbito europeo gracias a una movilidad investigadora reforzada por diversas becas y ayudas para estancias y participación en eventos científicos internacionales. En 2016, mis investigaciones recibieron la prestigiosa beca de estudios del Primer Imperio otorgada por la Fundación Napoleón. He impartido más de 50 conferencias en congresos y jornadas en Europa, USA y Canadá (la mayoría por invitación), y he publicado 49 textos entre los que destacan 1 monografía individual, 38 capítulos de libro y 10 artículos científicos, de los cuales un 67% pertenece a publicaciones internacionales en editoriales de prestigio y revistas indexadas. A esto se han de sumar la coordinación de 2 catálogos de exposición, y 3 monográficos de revista, en los que he conseguido reunir a numerosos especialistas internacionales que constituyen mi red de colaboraciones habitual. Mis capacidades de liderazgo se han visto fortalecidas gracias de la organización de 7 congresos internacionales en Francia e Italia, para los cuales he captado siempre financiación pública y privada. Poseo una consolidada experiencia docente y pedagógica, completada con la dirección de diversos trabajos de investigación, con la que he obtenido las acreditaciones a Profesor Titular en Francia (CNU, 2022) y Profesor Contratado Doctor por la ANECA (2023). Soy co-IP de un proyecto de investigación internacional con sede en Roma que reúne a 16 centros de investigación, y he si sido miembro de 7 proyectos de investigación I+D competitivos (4 activos en la actualidad), en los que siempre he conducido líneas de investigación propias. Mi experiencia profesional ha sido completada con la participación en proyectos expositivos en diversos museos internacionales (Rodin, Met, Louvre, entre otros), a lo que he añadido el comisariado en 4 exposiciones en Roma, Nápoles y Madrid. En materia de transferencia del conocimiento, he coordinado diversas actividades como series de videos de alta divulgación, y ciclos de conferencias. Cuento, además, con una sólida experiencia en desarrollo de actividades de humanidades digitales vehiculada a través de proyectos de innovación docente, edición y transcripción de fuentes archivísticas y gráficas, y bases de datos open access. Finalmente, he formado parte de numerosos comités científicos internacionales, y pertenezco a varios comités editoriales de revistas indexadas, habiendo sido evaluador de artículos para diversas publicaciones europeas.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | PALOMAR SANZ, TERESA |
| **Referencia:** | RYC2023-045699-I |
| **Correo Electrónico:** | t.palomar@hotmail.com |
| **Título:** | History and conservation of glass heritage |

**Resumen de la Memoria:**

My research is focused on the History and conservation of glass heritage.

In the line of "Archaeometry and technical art history", I have focused on the study of glass production throughout history, from the localization of the raw materials to the melting process of glasses, as well as some components added as stabilizers or coloring agents. Thanks to minor and raw elements, it is possible to trace trade routes, either on raw materials or on finished items, which are relevant from the artistic and sociological point of view to explore the transmission of knowledge between societies and cultures. Novel studies in this area are focused on Technical Art history, which seeks to discover the technology of glassmaking through the ages by making reproductions. In this line, I have focused my research on the archaeometrical analysis of archaeological and historical glass. The results of my research helped to understand the evolution of the glasses from the 1st to the 5th century in the south of the Iberian Peninsula and to distinguish the original glasses from those used during the different restorations in the Leon Cathedral and the Great Mosque of Cordoba. In the last years, I have also carried out some works to reproduce historical recipes from treatises and manuscripts. This historical documentation is a good source to know the glassmaking technology in each period, but it is necessary to have a deep knowledge of glass science to replicate and reproduce correctly the historical recipes.

The line "Conservation Science" is useful for choosing the most adequate environmental conditions to preserve historical objects with different chemical compositions in museums or private collections. In the area, I have analyzed samples from different stained-glass windows showing that potash-lime silicate glasses are the most vulnerable to the atmospheric environment, that the morphology of pits is related to environmental contamination, and that the degradation produced in Europe is slow in comparison to tropical areas. I have also worked on the 19th cent. crizzled glasses from La Granja during my ComFuturo Research Project, which permitted to improve the conservation conditions of the unstable glasses from the Royal Palace of Madrid and the Royal Glass Factory of La Granja. I have also worked with glasses altered in archaeological sites and altered in natural conditions on the seabed. Additionally, I have implemented novel techniques for examination and treatment (preventive and remedial conservation) for glass heritage conservation. In this area, I have applied for the first time different non-destructive techniques to characterize historical glasses such as Visible Hyperspectral Imaging, nonlinear optical microscopy or Micro-Computed Tomography. Additionally, I have assessed the aggressiveness of different cleaning procedures.

**Resumen del Currículum Vitae:**

Since I started my research career, I have been involved in research projects on the conservation of materials from cultural heritage. I have worked with archaeological and historical samples from the most important museums and institutions, such as the archaeological sites from Italica and Carmona (Seville), the National Museum of Roman Art (Merida), the Mosque-Cathedral Monumental Site of Cordoba, the Cathedral of Leon, the Spanish Museum of Underwater Archaeology (Cartagena), and the Canterbury Cathedral (UK), among others. The multidisciplinary collaborations with other researchers such as scientists, historians, conservators, artists, and personnel from museums gave me a unique cross-disciplinary expertise, which led the collaboration with different institutions such as the Spanish Cultural Heritage Institute (IPCE), the Andalusian Historical Heritage Institute (IAPH), the Center for Conservation and Restoration of Cultural works of Castilla y Leon, the Mosteiro dos Jeronimos (Lisbon, Portugal), or the Mosteiro de Batalha (Batalha, Portugal).

I have developed my scientific career in the Spanish National Research Council (CSIC), the Autonoma University of Madrid, the Spanish Centre Foundation of Glass (FCNV), and the Research Unit VICARTE "Glass and Ceramic for the Arts" (Portugal) through fellowships awarded in open and competitive calls: Fellowship Introduction for Research (JAE intro), FPU Research fellowship, FCT Postdoctoral Fellowship, ComFuturo Research Project, and FCT Assistant research contract.

My scientific production includes 54 publications in indexed journals, 6 peer-reviewed publications not included in indexed journals, 65 communications in national and international conferences, 13 dissemination articles, and 3 books as editor. All of them focused on Cultural Heritage. During 2017-2018 and since 2022, I have been leading the research line "Alteration of historical glass" in VICARTE, the FCT-UNL (Portugal). I am also moving forward in seeking resources from several national and international calls to guarantee the future of this research line, participating in calls, proposing research projects, and collaborating with other national and international researchers. This attitude allowed me to be PI of a ComFuturo Research Project (call 2017), 2 MOLAB and 1 FIXLAB actions (IPERION CH and IPERION HS H2020 projects), and 3 accesses to the Alba Synchrotron with projects focused on Historical glass conservation.

My participation in international collaboration projects as well as the research visits I enjoyed in high-level and competitive international research centers (> 4 years) is highlighted as an important aspect of my research career. I also have continuous collaborations with different research groups, both at national and international levels.

My expertise has also allowed me to be involved in teaching (>170 hours) and training activities: supervision of Doctoral thesis (2), Master thesis (4), and BSc projects (2). Additionally, I have been involved actively in organizing events for science dissemination.

In 2018, I received the Special Mention in the Young Researcher on Conservation Science Award.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | ESCHENBRENNER DIEMER, GERSANDE |
| **Referencia:** | RYC2023-045445-I |
| **Correo Electrónico:** | g.eschenbrenner@uah.es |
| **Título:** | Estudiar la sociedad del antiguo Egipto a través del prisma de un material: la madera |

**Resumen de la Memoria:**

Obtuve dos diplomas de enseñanza superior en la Université Lumière Lyon 2 (Francia): el primero en Historia (2002) y el segundo en Historia del Arte y Arqueología (2003). Antes de realizar el doctorado, obtuve una licenciatura en Arte y Arqueología (Lyon, 2004) y un máster en Historia y Arqueología de los Mundos Antiguos (Lyon, 2006). Paralelamente a estos estudios, cursé un Diploma Universitario de Estudios Especializados en Egiptología (4 años de aprendizaje de la lengua egipcia (jeroglífica, hierática y ptolemaica), arqueología e historia de la civilización egipcia (Lyon 2004-2008). Con el fin de combinar el análisis material y la investigación egiptológica, conseguí establecer una codirección entre la Universidad de Lyon II y el Centre de Recherche et de Restauration des Musées de France (París, museo del Louvre), la primera en la historia de ambas instituciones, y obtuve mi doctorado en Egiptología (París/Lyon 2013: matrícula de honor con felicitaciones del jurado). Tras mi doctorado, como becaria Marie Curie en el University College de Londres, me formé en el análisis anatómico de la madera (Kew Garden, Londres 2016-2018). Combinando la egiptología y la arqueobotánica, estoy especializada en el material de madera y sus redes económicas, artísticas y sociales en el Antiguo Egipto, principalmente durante los milenios II y I antes de Cristo. Este enfoque científico, que devuelve al material el lugar que le corresponde dentro de los estudios arqueológicos e históricos, es un planteamiento innovador que dirijo y defiendo desde hace más de 15 años en un ámbito académico, la egiptología, donde el texto sigue considerándose superior a cualquier otra fuente y el material es anecdótico. Al abordar el estudio de la madera desde una perspectiva global que parte del objeto manufacturado y se remonta al árbol, combinando la arqueometría y las ciencias arqueológicas e históricas, he desarrollado una nueva disciplina en mi campo de investigación, y estoy formando en ella a jóvenes colegas. He publicado ampliamente en el campo de los estudios sobre la madera, sentando las bases de una nueva disciplina en egiptología, y he organizado dos conferencias internacionales, una dedicada a las redes de la madera en Egipto (2021) y otra a la conservación de la madera sobre el terreno (2022) y un seminario (2023). Mi participación en diversas misiones arqueológicas en Egipto en yacimientos antiguos e islámicos (12 excavaciones diferentes) me ha permitido llevar a cabo un estudio diacrónico de la madera material en Egipto y más allá de sus fronteras territoriales que soy el único en dirigir dentro del ámbito egiptológico. Estoy especializado en la madera y sus redes económicas, artísticas y sociales en el Antiguo Egipto sobre las que he publicado extensamente. La cuestión de la materialidad está en el centro de mis investigaciones, lo que me permite desarrollar mis investigaciones sobre las cuestiones de los talleres y las funciones profundas de la madera desde el punto de vista social y religioso, y más particularmente sobre los usos profilácticos relacionados con la utilización del material madera en el Antiguo Egipto. Además, como IP de siete proyectos, he contribuido a los objetivos generales de mis grupos de investigación. Superviso la configuración de dos equipos de 10 y 7 expertos y colaboro con 5 proyectos internationales.

**Resumen del Currículum Vitae:**

Antigua investigadora Marie Sklodowska-Curie en el University College of London, (Proyecto TRACER financiado por el Consejo Europeo - proyecto n°536344) entre 2016 y 2018, obtuve un proyecto postdoctoral en la Universidad de Jaén (Acción 6 Plan Propio de Investigación) entre 2019 y 2021. Desde enero de 2022, soy investigadora María Zambrano en la Universidad de Alcalá de Henares. Tras haber liderado el proyecto PERCEA Bois (IFAO/UCL n°18315) durante 2 años (IFAO), coordino como Investigadora Principal, el programa EBENES (proyecto IFAO n°20211) desarrollado durante 5 años (2020-2025) en colaboración con instituciones internacionales. Desde 2019, soy investigador asociado en el laboratorio ArScAN (CNRS-UMR 7041) donde coordino un programa de investigación titulado "Del árbol al trabajo". Miembro del proyecto MORTEXVAR (2018-T1/HUM-10215 Programa Talento, financiado por la Comunidad de Madrid) y de la Red RIIPOA (www.riipoa.com), soy coordinadora del eje dedicado a la Materialidad. Como arqueobotánico y egiptólogo, colaboro como especialista en madera en varias misiones arqueológicas en Egipto: Qubbet el-Hawa (Universidad de Jaén), Elefantina (Instituto Suizo de El Cairo), Deir el-Medina (IFAO) dentro de la cual dirijo un equipo de investigadores especializados en el estudio del mobiliario de madera, Wadis Occidental (Universidad de Cambridge). En 2022, con el fin de reunir estos diferentes proyectos sobre la madera bajo una misma bandera y formar un equipo de especialistas de la madera en Egipto, creé el proyecto Medjehu, Researching wood craftsmanship along the Nile, que dirijo como IP (https://www.medjehuproject.com/). Difundo esta investigación a través de conferencias invitadas y contribuciones a congresos internacionales, además de varias publicaciones reconocidas. Mis conocimientos transversales y mi experiencia como coordinadora de equipos y proyectos me permiten proponer un estudio exhaustivo de la artesanía de la madera de una forma innovadora que ha sido especialmente destacada por la comunidad científica. He coorganizado dos congresos internacionales dedicados a la madera en Egipto. Recibí formación en análisis xilológico de dos anatomistas de la madera reconocidos internacionalmente: P. Gasson en los Laboratorios Jodrell (Real Jardín Botánico de Kew en Londres). Esta doble formación como egiptólogo y anatomista de la madera me confiere una capacidad analítica única que me ha valido el reconocimiento internacional como especialista en redes de madera en Egipto. He impartido varios cursos sobre artesanía de la madera en universidades francesas, egipcias, británicas, estadounidenses y españolas (Lyon, Alejandría, Jaén, Alcalá de Henares, Baltimore) y soy invitado a dar seminarios sobre mi especialidad. Mis investigaciones, que han recibido excelentes críticas por parte de mis colegas, y la amplia financiación que he recibido para el desarrollo de los diversos proyectos de investigación que dirijo hacen que actualmente se me reconozca como la autoridad en estudios sobre la madera en Egipto y me permiten evaluar los diversos proyectos que se están llevando a cabo sobre la madera en Egipto y Oriente Próximo.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | GINTSBURG , SARALI |
| **Referencia:** | RYC2023-043912-I |
| **Correo Electrónico:** | sgintsburg@unav.es |
| **Título:** | Traditional Arabic Philology and Current Topics in Humanities: Unlocking the Potential |

**Resumen de la Memoria:**

I am a truly interdisciplinary researcher, following the example of brilliant scholars in my field from the not so distant past, who did not limit themselves to one narrow topic in linguistics or literature but, instead, researched on a wide range of topics within the realm of Arabic Studies - history, Islam, language (classical Arabic and dialectology), literature, Islam. Thanks to the topnotch classical education I received, I have the expertise to work in various fields of scholarship related to Arabic philology and I willingly accept this challenge. In addition, I combine my knowledge of traditional Arabic Studies with an understanding of current trends in humanities - cognitive linguistics, multimodal analysis, narrative studies. I also successfully collaborate with a number of scholars with various backgrounds - our collaboration is reflected in my international projects and publications. A considerable part of my research in linked to socially relevant topics, first and foremost migration, identity, and cultural codes but also literature and literary canons, and preservation of oral heritage in endemic and diasporic contexts and in its various forms. As an Arabic philologist, I maintain a double-strategy: publish my papers and chapters in mainstream WOS-indexed publishing venues but at the same time, maintain my reputation by publishing in specific journals and publishing houses known in the world of those, involved into the Arab Studies but less known outside our field. I do my best to make my publications Open Access, at least in the form of pre-prints. In addition, when it is feasible, I publish in Open Access venues.

**Resumen del Currículum Vitae:**

I am a full-time researcher at the Institute for Culture and Society, University of Navarra. I came to Navarra in 2017 as a MSCA fellow, prior to that I worked as a lecturer in cultural anthropology & global studies at the UH-Clear Lake, Texas (USA) and earlier as a lecturer in Arabic language & literature. I define myself as an Arabic philologist, which implies capacity to work with a wide spectrum of materials and apply various approaches that fit under the umbrella of the term "philology". Within the scope of my MSCA project, I conducted fieldwork sessions in Morocco, Zanzibar and Soqotra, and developed methods for multimodal analysis of oral live performances and grassroots literary production. I now use my expertise in my research on multimodal digital narratives in Arabic language, a topic on which studies are scarce. My research on Arabic language covers several regions either within the Arab world, or outside it but linked to it culturally and linguistically. I In my long-term research trajectory, I aim to continue approaching the Arab World and use theories widely applied to Western society by validating them in a new, non-Western context. I published research applying multimodal analysis on YouTube video narratives of a Moroccan immigrant (2023), on heterotopic spaces of Abdulrazak Gurnah (2023), but also on identities and cultural practices of African community in Soqotra (2022, 2024). Further, I am a member of international editorial board for 3 journals: Arabiaytuna (since 2021), DiGeSt (since 2022) and Social Sciences & Humanities Open (since 2024). I also published widely on topics related to literary canons, cultural codes and digital performance in the Arab world (with M. Baynham, 2022). I have 11 publications in the WOS (1st and 2nd quartile, core collection), 138 citations in google scholar, (h-index 4). In total, I edited two collections of chapters (with Bloomsbury, 2022 and Lexington Books, 2023), a special issue (Rilce, 2020) and have over 40 academic publications.

In the course of my full-time researcher career at the ICS, I developed strong leadership skills: during the last two years I was the PI of 5 projects (European and regional). In 2023, the Government of Navarra granted me with a certificate of appreciation, where the social impact of my research was specifically praised. I also have a strong profile as a university lecturer with over 1000 hours of teaching various disciplines. In addition, I am now co-supervising my first postdoc student Yegeniya Gutiva (Juan de la Cierva), who is researching on Berber communities in Navarra. In 2023, the Spanish AEI granted me a R3 certificate. My level of expertise and interdisciplinarity are highly valued by the REA (European Commission) and I am regularly invited to work as an expert-evaluator an rapporteur of European projects (ERC, MSCA, E-COST).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Cultura: filología, literatura y arte
**Nombre:** SABRINE , ISBER
**Referencia:** RYC2023-044332-I
**Correo Electrónico:** esper.1985@yahoo.com
**Título:** Protection of cultural heritage in Conflicts

**Resumen de la Memoria:**

Dr. Isber Sabrine's extensive experience spanning over 13 years in cultural heritage protection in conflict zones showcases a commitment to both practical work and academic contributions. Utilizing the methodology of action research. Dr. Isber Sabrine's extensive experience, concentrated in 3 main pillars , the first understanding the illicit traffic of antiquities in conflict zones ,the second is focusing on developing new methodologies for the protection of cultural heritage during conflicts, especially emphasizes the pivotal role of new Civil Society Organizations (CSOs) initiatives in cultural heritage protection and the third is focusing on using heritage for the integration and wellbeing of refugees has proven the need for utilizing culture to build respect, peace, and appreciation towards refugees in European society.

Dr. Isber Sabrine has founded several initiatives within his NGO Heritage for Peace in the field of heritage protection in conflict, demonstrating his ability for independent action and leadership. These initiatives contribute to the tangible preservation of historical sites and empower local communities and refugees, providing them with opportunities for skill development, cultural exchange, and active participation in heritage protection. Dr. Sabrine's dedication to combining practical, on-the-ground efforts with academic research further strengthens the impact of these projects. Dr. Sabrine also managed and supervised many individual projects on heritage protection during conflicts. These projects focus on heritage documentation, preservation, and community engagement. The funding from reputable organizations demonstrates Dr Sabrine's commitment to, and strong track record of, successful grant applications. These projects also showcase Dr. Sabrine's commitment to utilizing digital tools, along with capacity building, and documentation efforts to protect cultural heritage in conflict zones. The partnerships with reputable foundations and organizations highlight the significance and impact of these projects.

Dr. Isber Sabrine's commitment to work in the field of cultural heritage in conflict will continue with RYC scholarship. His work will include two main lines of research: the first will develop new understandings of illicit traffic of antiquities in conflicts by creating a new methodology and innovation projects for the protection of cultural heritage during conflicts, Dr. Sabrine's research in this area contributes to addressing the challenges posed by the illicit trade of cultural artifacts during conflicts. By gaining insights into the dynamics of this trade, his work will inform policies and interventions to combat illegal activities and protect valuable heritage. The research will comprise an investigation into the looting and illicit trade of Syrian and Yemeni antiquities. while the second pillar with RYC will continue to research utilizing cultural heritage as a tool for integration and social inclusion for refugees in Europe, aligning with the research goal of fostering community engagement and well-being. This work contributes to the positive impact of cultural activities on individuals and communities, particularly those affected by displacement.

**Resumen del Currículum Vitae:**

Dr Isber Sabrine is a Syrian archaeologist, specialized in cultural heritage. Since 2011, he has been involved in projects and studies on the protection of cultural heritage during conflicts. He got his PhD from the University of Girona and the Spanish National Research Council. His PhD is entitled Protecting cultural heritage during conflicts: Syria's cultural heritage during the present conflict and the local efforts to protect it.

He is currently chair and co-founder of the international NGO Heritage for Peace. Since 2015, he has been involved in cultural initiatives for refugees and immigrants in Europe. He is leading the Abuab Initiative, which is a social project that works on using cultural heritage as a tool for intercultural dialogue with refugees and immigrants from the Middle East, North Africa, and Ukraine. He also is leading the Arab network of Civil Society organization (ANSCH), a joint initiative of the non- governmental organization (NGO) Heritage for Peace (H4P) . The initiative works with government agencies, CSOs, and non-profit organizations to identify, manage, plan and conserve archaeological sites, historical monuments, museums, and other cultural heritage resources. Its work is now concentrated in Syria, Iraq, Libya, Sudan and Yemen. Over 13 years of experience in the field of cultural heritage in conflict, he developed a career which combines cultural protection actions with research in countries in conflict. His research is focusing on three pillars. The first one is understanding illicit traffic of antiquities in conflicts, the second is creating new methodology and innovation projects to act on the protection of cultural heritage during conflicts, and the third is using cultural heritage for integration and social inclusion for refugees in Europe. He published a book, several papers, and many book chapters on these three pillars of research. Dr. Sabrine further enriched his research by collaborating with different European research centers during his PhD studies. Between 2012 and 2014, he spent several months at the University of Bologna in Italy. Between 2015 and 2016, Dr. Sabrine was member of the Syrian Heritage Archive project at The Museum of Islamic Art at Pergamon Museum in Berlin. Since 2017, he has been a member of the Trafficking Culture research group, an interdisciplinary research consortium with an overall interest in understanding the illicit trade in cultural objects and developing and refining an evidence base for promoting effective policy interventions to reduce this global form of trafficking.

During these years he contributed to building capacity through teaching and training for heritage workers and students (including expert supervision and mentoring for postgraduate students). For his research and heritage protection. Dr Sabrine got many grants from private foundations such as the International Alliance for the Protection of Cultural Heritage in conflicts, Gerda Henkel foundation, Cultural Protection Fund of the British Council, The Prince Claus fund, and from public institutions such as the ministry of foreign affairs in Spain and in Nederland and the Town hall of Barcelona. He is a polyglot able to work in 8 languages Arabic, English, French, German, Spanish, Catalan Italian and Russian (worked/studied/lived in Italy, Spain, Jordan, Turkey, Mexico Syria, and Germany.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | CORTÉS , CONCEPCIÓN |
| **Referencia:** | RYC2023-045196-I |
| **Correo Electrónico:** | islauniverso@hotmail.com |
| **Título:** | animal studies, non-human animals as authors in art, culture and history |

**Resumen de la Memoria:**

Currently a Juan de la Cierva-Incorporación postdoc fellow (2021-24) at Universidad de Málaga, my trajectory stands out for its internationalization and a sciences-humanities interdisciplinarity, especially between art history, biology and other related disciplines. This transversality is favoured by animal studies, not very present in Spain. Thanks to my background in biology (3 years), in my PhD dissertation (recognised with Premio Extraordinario) I studied the presence, perspectives, and agencies of other animals in contemporary art and visual culture. I addressed issues of ethology, perception, and the brain to underscore the aesthetic and creative contributions of some animals, a very innovative topic. In my research, I have continually approached other animals as authors and creators, from Michael, the gorilla speaking American Sign Language whom I treated in the chapter, cited 13 times, "Nonhuman Animal Testimonies: A Natural History in the First Person?" (The Historical Animal, Syracuse Univ. Press 2015), to the artistic bowers of the bowerbirds, or to the blackbirds mimicking and archiving human sounds as part of their songs, effectively singing their more-than-human histories (as I recounted in the article "Sobre la historia de los cantos de las aves o los cantos de las aves como historia", História, Ciências, Saúde-Manguinhos, 2021, or the chapter "Blackbird Songs: More-than-Human Aural Histories in the Anthropocene," Building Common Ground: Ecological Art Practices & Nonhuman Knowledges (Ca' Foscari 2023). My current research focuses mainly on birds and insects, the latter, on the vision and perception of flies as seen across the centuries, and in collaboration with the Finish group "Humans & Insects in Multispecies Networks". This bird-insect research is framed by the R&D project I lead as its principal researcher, "Entomornitofilias (y fobias): Impresiones y encuentros de aves e insectos" B1-2022_11, Plan propio, UMA, with 7 researchers, including 2 PhD candidates I co-direct and mentor, with dissertations on bird-human relations in cities through art practice and neuroarthistory (I also directed 2 TFGs). Other international collaborations are with the Zoo Studies group (Utrecht Univ.) or a research associate ornithologist at APLORI, Nigeria.

**Resumen del Currículum Vitae:**

Juan de la Cierva-Incorporación postdoc fellow (2021-24) at Universidad de Málaga, with a trajectory that stands out for its internationalization and a sciences-humanities interdisciplinarity, especially between art history, biology and other related disciplines. This transversality is favoured by animal studies, that I have specialised on, not very present in Spain. I study the presence, perspectives, and agencies of other animals in contemporary art and visual culture. To made animal studies better known nationally I lectured in 14 institutions, and coedited with Reyes Escalera the special issue "Animals & Art History" (Boletín de arte 2019), a pioneer effort that will be followed by a forthcoming issue on "Animals, Science, History" in the CSIC journal Asclepio. I trained in animal studies through 3 stays: National Art Library, V&A Museum; New Zealand Center for Human-Animal Studies, U. of Canterbury, where I am an International Associate, and Massachusetts Institute of Technology, hosted by Harriet Ritvo, great historian of animal subjects. Between Oct.-Dec. 2018 I did a postdoc stay with Carla Subrizi at La Sapienza (Rome), and in Oct. 2019 another at Univ. of Middlesex with the renowned academic Katy Deepwell. An ongoing transdisciplinary collaboration with Museo Nacional de Ciencias Naturales (MNCN, Madrid) has translated into another stay (Sep.2022-Jan.2023), and an exhibition as adjunct curator ("Antonio de Zulueta. Primer genetista de España, Dec.2021-Aug.2022), being co-author of its catalogue.

Between 2017-21 part of a national R&D project on art and body cognition with environmental concerns led by Tonia Raquejo (HAR2017-85485-P), involving 2 books and several seminars, and a stay at UCM where I taught a 45h seminar on animals and art, senses other than vision or birdsong. Since 2017, and through the close entanglement between animal studies and gender studies, part of 2 national R&D projects on art and gender "Desnortadas. Territories of gender", PID2020-115157GB-I00; and "Practices of subjectivity in contemporary arts" HAR2016-75662-P, involving the organization of 2 Internal. Conferences (Mar.2019 & May2023); the coordination of their 2 inaugural seminars (Rome & London), and coediting the book Yo somos otras: Prácticas de la subjetividad en la creación with Carmen Cortés & Javier Cuevas (U. de Granada 2021).

Published 11 chapters in total (6 internal.), by Routledge, Palgrave Macmillan, Ca' Foscari, Leuven Univ. Press, J.B. Metzler, CENDEAC, McGraw Hill or Plaza y Valdés, plus 8 in press (all of them internal.). 8 journal articles (4 internal.) in indexed peer-reviewed journals. 3 reviews, 5 papers in conf. proceedings, 2 articles of knowledge transfer and 3 others in press (3 internal., on ArtUK, AWARE, ArtActuel), several radio shows, interviews and 14 didactic books on animals. At least 143 citations retrieved. I3 certificate for research quality.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | ZNOROVSZKY ZNOROVSZKY, ANDREA-BIANKA |
| **Referencia:** | RYC2023-042877-I |
| **Correo Electrónico:** | znorovszkyandrea@usal.es |
| **Título:** | Marian Devotion in the Iberian Peninsula and Beyond from the Middle Ages to the Early Modern Period |

**Resumen de la Memoria:**

My primary research interests are bidirectional as I focus on: 1). the construction of gender reflected in the visual representations of cross-dressed holy women in connection to processes of iconographic syncretism and Marian iconographic influence and 2). the apocryphal nature of Marian depictions with particular emphasis on the early life of Mary during the Middle Ages/the Early Modern Period. In the next phase of my career, I plan to focus on Marian devotional processes in the Iberian Peninsula, the Americas, and the Philippines.

My research has a clear impact, with 187 paper mentions and 3,346 views on academia.edu, an h-index of 1, 3 indexed works in Scopus, 5 in the Index of Medieval Bibliography (Brepols), 3 in Google Scholar, 5 edited volumes, of which 2 with top-leader publishers, Routledge and Brepols, sold worldwide in a total of 271 copies. I am familiar with the selection and evaluation of interdisciplinary research essays and their review process as I have coordinated and supervised the scientific content of 41 book chapters. This experience familiarized me with all aspects of editorial and production processes, review and administration.

My intense international activity includes over five years of working experience in four universities (American University of Central Asia, Austrian Academy of Sciences/ Salzburg University, Ca' Foscari University of Venice, University of Salamanca) and participation in 4 inter/national prestigious research projects including 2 Marie Skłodowska-Curie Research Fellowships. Throughout my career, I have shown independence in my research as well as strong leadership, team work, and coordinating skills, as the PI of 4 grants collaborating with a broad variety of scholars, institutions, and organizations, and by organizing 1 international conference and 19 sessions/panels at international congresses. Finally, I have proven my ability to obtain competitive funding, including 2 prestigious post-doctoral contracts in the EU Marie Skłodowska-Curie Actions programs (2017; 2022) and 2 research fellowships with the Austrian Academy of Sciences and Ca' Foscari University of Venice. The MSCA 2017 programme's success rate was 15,03% to 9089 submitted proposals.

I am at the optimal stage of my career to establish an independent research group on the visual culture of the Middle Ages and the Early Modern Period, with particular emphasis on Mariology and the cult of saints. I have the experience, the curiosity, the motivation, and the commitment to exploit my research outcomes in further projects. In this regard, the Ramon y Cajal fellowship is an ideal opportunity to reinforce and continue my investigation on the visual culture of the Middle Ages, to allow me to contribute to innovation in the area of Iberian visual culture and devotional processes, to start my own research group leading to impactful research outputs fundamental to my/the team's growth recognized in Spain and worldwide.

**Resumen del Currículum Vitae:**

I am a medievalist focusing on the visual culture of the Middle Ages in relation to hagiography and the cult of saints. My current goal is to determine the influence Marian iconography (and the vita Mariae) has had in devotional processes pertaining to the Iberian Peninsula and its cultural transfer to the Americas and the Philippines.

My research plan builds on my earlier investigations and expands in terms of methodology (neuro/arthistory, cognitive studies, the study of emotions) and geographic areas (Eurasia, the Americas). During my PhD. (2016) at the Central European University, I have focused on the iconography of 4 cross-dressed saints (a particular group of holy women) and the influence Marian visual and textual representations (especially apocryphal) have had over their depictions. In addition, I have investigated 1. the relation between Marian iconography and apocryphal narratives in 14-16th - century manuscript illuminations from France as a recipient of a MSCA IF fellowship (2018-2020) with Ca' Foscari University of Venice, Italy, and 2. the visual representations of Saint Marina the Monk, a cross-dressed saint, with emphasis on the Mediterranean basin, as a recipient of a MSCA COFUND fellowship (2022-2025) with the University of Salamanca, Spain. Throughout my academic career, I have gained skills in the analysis of visual material in relation to religious/cultural contexts (Research Fellowships) and in relation to gendered and hagiographic contexts (PhD). Together with my previous research outcomes, these excellent skills provide a solid foundation for further research on the mechanisms of Marian devotion in the Iberian Peninsula and beyond (the Americas, and the Philippines) during the Middle Ages and the Early Modern Period.

My curriculum is characterized by international experience and by international publications with high impact. I am the sole author of 18 peer-reviewed articles (all of them without my PhD supervisor) published in high impact journals in the field of Humanities and the co/editor of 5 volumes on Mariology, apocryphal narratives, women and gender in the Middle Ages published with top-leader publishers: Routledge and Brepols. I have also delivered 29 conference papers at international congresses and conferences.

Throughout my academic career, I have developed the ability to carry out independent research projects and to attract international funding. Since my PhD, I have been employed full time on prestigious competitive European and national research fellowships, and I have been extremely successful in securing funding - a total of EUR 392,779.04 - as sole PI.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | GUERRA MIRANDA, LUIS RENE |
| **Referencia:** | RYC2023-042721-I |
| **Correo Electrónico:** | luis.guerra.miranda@uniarts.fi |
| **Título:** | Art as Repair Pedagogy. How can artistic education enable spaces for Democracy and Social Justice. |

**Resumen de la Memoria:**

Tengo una formación profesional inusual, proveniente de las artes como de la filosofía e incorporando conocimientos especializados de contextos europeos y latinoamericanos. He demostrado mi capacidad para poner en contacto crítico campos generalmente ajenos o poco cuestionados en el contexto contemporáneo, señalando metodologías, modelos y prácticas no reconocidas por los regímenes disciplinarios académicos. Poseo un amplio conocimiento de cuestiones artísticas y filosóficas tradicionales y contemporáneas y una profunda comprensión de los cambios históricos recientes en las artes y la cultura globalizada.

Mi línea de investigación está centrada en el ámbito del pensamiento y la pedagogía artística. Esta línea, de la cual he sido el Investigador Princiapl, ha sido realizada a través de contratos y becas competitivos otorgados por el Research Council of Finland (Fondo Profi6, 2022, proyecto Sustainable relationships as embodied cognitive devices. An enactive approach towards Artist Pedagogy, 42.000,00 €; Fondo Profi7, 2023-2026 proyecto Gestural Philosophy, 153.000,00 €), las fundaciones finlandesas Kone y Saastamoinen Foundation, así como por el OSIC-Generalitat de Catalunya, D/480000103/4411/0000, 2017; D/480000190/4411/0052, 2021 y D/480000103/4411/0000, 2022. El título de la presente investigación es Art as Repair Pedagogy. How can artistic education enable spaces for Democracy and Social Justice. El objetivo de esta investigación es generar un nuevo marco teórico y práctico desde una perspectiva reparadora en el campo de la educación y pedagogía del arte tanto en el ámbito público como privado de la educación, que implique fortalecer nuestras concepciones de creación y cultura en la esfera pública, asumiendo e incluyendo la necesidad de responder a diferentes problemáticas globales y locales a través de metodologías artísticas que reflejen la diversidad y complejidad de nuestras sociedades, reconociendo nuestras raíces, lenguajes y formas de vida diversas, así como la urgencia ante los cambios eco-sociales. El enfoque reparador propuesto por esta investigación pretende considerar las prácticas artísticas contemporáneas desde una perspectiva inclusiva y regenerativa como formas pedagógicas crítico-cognitivas, reflexivas y experimentales. El enfoque reparador se centrará en las redes y relaciones construidas entre las comunidades sociales, las prácticas artísticas reparadoras y su potencial pedagógico en un contexto social y político informal y extendido.

Mi investigación se centra en iniciativas artísticas en España y Europa que, sugiero, ya adoptan una perspectiva reparadora, respondiendo a necesidades materiales e inmateriales colectivas, extendiendo la reparación hacia los límites de las relaciones sociales, los campos emocionales, las performatividades comunicativas, las poéticas de la atención y las ecologías del afecto colectivo. Al hacerlo, contribuyen a un cambio de paradigma global en el campo de las prácticas artísticas y el pensamiento artístico y, específicamente, es el propósito de esta investigación, en el campo de la pedagogía artística y, por ende, en los campos de la tecnología, políticas públicas, y educación.

**Resumen del Currículum Vitae:**

Soy artista visual y doctor en Filosofía (summa cum laude, Facultad de Artes y Humanidades, Universidad Autónoma de Barcelona, 2017). Actualmente ocupo el puesto de Investigador Senior en el Research Institute de la University of the Arts Helsinki, con el proyecto de investigación Gestural Philosophy, del cual soy el Investigador Principal, financiado por el Fondo Profi7, 2023-2026. Desarrollé dos periodos de contrato postdoctoral: 2019-2020 en el Center for Artistic Research y 2022-2023 en la Academy of Fine Arts de la University of the Arts Helsinki, clasificada #25 en el QS WUR Ranking Arts 2023. He desarrollado una serie de estancias de investigación doctorales y postdoctorales apoyadas por instituciones culturales internacionales, como el Künstlerhaus Büchsenhausen, 2022 (Austria), Museo Nacional Centro de Arte Reina Sofía, 2016 (España), Kunststiftung Baden-Württemberg, 2015 (Alemania), Comisión Nacional de Investigación Científica y Tecnológica Conicyt, 2013-2017, entre otros. He dirigido 6 proyectos de investigación competitivos como Investigador Principal y participado como investigador becario en grupos de investigación. Tengo una amplia experiencia docente en las áreas de arte, estética, filosofía de la cultura (University of the Arts Helsinki; Universidad de Barcelona; EINA-Universidad Autónoma de Barcelona) y diseño (BAU Barcelona) a niveles de grado, magíster y doctorado. He dirigido tres tesis de máster en los campos de la filosofía (UB), el arte y el diseño (EINA_UAB), y actualmente codirijo dos tesis de doctorado en Diseño, Pedagogía y Comunicación en BAU Centro Universitario de Arte y Diseño Barcelona. He obtenido becas, premios y financiación de instituciones públicas y privadas en Europa y Latino América. He publicado artículos (21) en revistas de alto impacto, capítulos de libros (4) y dos libros monográficos (2017, Brumaria Editores, Madrid; 2022, Errant Bodies Press, Berlin).

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | COLUCCI , DALILA |
| **Referencia:** | RYC2023-042865-I |
| **Correo Electrónico:** | dcolucci@us.es |
| **Título:** | Literatura italiana e intermedialidad: desde el siglo XX hasta hoy |

**Resumen de la Memoria:**

Mi investigación abarca temas del ámbito de la literatura, arte y cine italianos modernos y contemporáneos, con enfoque especial en la intermedialidad.

En el pasado, me he ocupado de prácticas literarias híbridas y especialmente de las interacciones entre la ficción (tanto narrativa como cinematográfica) y la poesía. En este contexto, he analizado ampliamente algunos grandes escritores del siglo XX, como G. Parise, C.E. Gadda, P.P. Pasolini. Al mismo tiempo, mi interés por los fenómenos intermediales me ha llevado a indagar el imaginario literario, visual y político de la cultura italiana y europea, con particular atención a lás siguientes líneas: expresiones artísticas del Futurismo y las Vanguardias europeas; la relación problemática en la Italia de posguerra entre fotografía y cine en la representación de la realidad; las huellas utópicas en los relatos de viajes desde el siglo XVII hasta hoy; las formas experimentales de la novela italiana contemporánea; y las interconexiones entre literatura, urbanismo y humanidades digitales.

Uno de los últimos desarrollos de esta trayectoria multidisciplinar es mi actual proyecto como investigadora María Zambrano en la Universidad de Sevilla: "Intermedia Italy: Poetry and Visuality in the Twentieth Century", que se centra en los encuentros entre la poesía y todas las formas de manipulación visual (tipografía, fotografía, teatro, música, etc.) en Italia desde 1912 hasta 2000, considerando autores al margen de los estudios italianos tradicionales (Tullio d'Albisola, Ketty La Rocca, Stelio M. Martini, entre otros). El objetivo último de esta investigación es revelar una dimensión especial de la poesía italiana del siglo pasado muy poco tomada en consideración por la crítica, capaz de abordar las cuestiones más acuciantes de la era (post)moderna (como la sociedad de masas, el discurso de género, la revolución tecnológica y la electrónica) a través de una fusión transgresora de medios y formas de expresión.

Mi nueva línea de investigación representaría un paso coherente, aunque completamente nuevo, respecto a la trayectoria descrita, pasando de la poesía del siglo XX a la prosa hiper-contemporánea, con el objetivo de explorar y comprender el polifacético panorama de las narrativas italianas de los últimos veinte años (2000-2022) que pertenecen al género del iconotexto: un objeto creativo intermedial en el que texto e imágenes no sólo coexisten, como en las formas tradicionales de las novelas ilustradas, sino que se juntan en una fusión pluriforme. A partir de las aportaciones académicas existentes, este nuevo proyecto de investigación se propone analizar en profundidad materiales primarios, proporcionando un estudio de casos concretos para identificar la singularidad del escenario italiano y sin perder de vista el panorama internacional más amplio de los iconotextos narrativos (en contexto europeo y norteamericano). Mi objetivo es demostrar cómo las prácticas iconotextuales hipercontemporáneas están redefiniendo la narrativa italiana en sí misma, rechazando las expresiones convencionales de realismo (ineficaz en nuestra cultura mediatizada) y abordando cuestiones sociales, políticas, culturales mediante un hiperrealismo que se radica en la contaminación extrema de documento y narración, verdad y mistificación, de lo visible y lo invisible.

**Resumen del Currículum Vitae:**

Soy doctora por la Scuola Normale de Pisa (Disciplinas Filológicas y Lingüísticas Modernas, 2016) y por Harvard University (Lenguas y Literaturas Románicas, 2018). En esta última universidad he impartido cursos de Lengua y Literatura Italiana (2011-2020) y he sido becaria postdoctoral De Bosis (2019-2020).

Como Investigadora Distinguida María Zambrano en la Universidad de Sevilla, llevo a cabo el proyecto "Intermedia Italy: Poetry and Visuality in the Twentieth Century", que explora la evolución intermedial de la visualidad (incluyendo pintura, tipografía, fotografía, cine, música) como fuerza impulsora de la modernidad poética italiana (1912-2000). De esta investigación resultó una monografía sobre el libro de metal futurista "L'anguria lirica" (1934), publicado por Brill (SPI, Q1); y el número especial "Neofuturism", editado con G. Berghaus y T. Klähn para el «International Yearbook of Futurism Studies», publicado por De Gruyter (SPI, Q1). En el campo de la visualidad poética, he publicado muchos ensayos y organizado el simposio internacional "Embodied Words. Concrete & Visual Poetry in Italy and Belgium in the 60s and 70s" (Bruselas 2018). Actualmente mi interés se encamina hacia la prosa, analizando las narrativas iconotextuales italianas contemporáneas. Sobre este tema, coordiné una sección en el XXV Congreso AIPI (Palermo 2022) y edité un volumen en prensa para la editorial Cesati (SPI, Q2).

El interés por la intermedialidad ha caracterizado toda mi trayectoria investigadora en el campo de la Literatura Italiana Moderna y Contemporánea. En el pasado, he trabajado en las intersecciones entre prosa y poesía en autores del siglo XX, en particular C.E. Gadda y G. Parise. A este último he dedicado una monografía (2011), una edición italo-francesa de sus poemas (2016) y un estudio comparativo que analiza las interacciones de reportaje, ficción y poesía en las crónicas japonesas suyas y de R. Barthes (FUP 2016, SPI, Q2). Sobre la contaminación osmótica de géneros literarios en Gadda estoy finalizando un libro monográfico; y he contribuido al volumen "Gaddabolario" (Carocci 2022). Por otro lado, mi trabajo editorial para "Alias", la primera antología translingüe de poesía contemporánea ítalo-española (Ensemble 2023), es fruto de mi investigación sobre las formas poéticas transculturales. Además, soy autora de más de 20 ensayos publicados en revistas del nivel más alto (SJR Scimago y ANVUR), enfocados en el imaginario literario y visual de escritores italianos desde T. Tasso a P. Pasolini, hasta las mujeres artistas contemporáneas. Algunos de mis últimos trabajos tratan las interconexiones entre literatura y urbanismo: como un artículo sobre "Las ciudades invisibles" de Calvino y la planificación urbana, publicado en «JPER» (SJR, Q1); y dos proyectos de Inteligencia Artificial: "Strolling Cities" (Bienal de Venecia 2021, financiado con 200.000€) y "Milan Factory of Future" (MEET Digital Culture Center & Milan Malpensa Airport 2023, financiado con 400.000€).

He participado en más de 30 congresos internacionales. En la Universidad de Harvard, he sido comisaria de la exposición "In Africa it is Another Story: Looking Back at Italian Colonialism" (2014), organizadora de la conferencia de Italiano "Time to Translate/Translation in Time" (2015) y coordinadora de las vídeo-entrevistas del De Bosis Colloquium in Italian Studies (2016-2017).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Cultura: filología, literatura y arte
**Nombre:** ALMELA LEGORBURU, IÑIGO
**Referencia:** RYC2023-043691-I
**Correo Electrónico:** inigo.almela@gmail.com
**Título:** Conception and Evolution of Socio-religious institutions in the Medieval Islamic West. An approach through Architectural Configuration and Textual Sources

**Resumen de la Memoria:**

It has been a decade since I started working on Islamic architecture in the framework of the Western Mediterranean thanks to my participation in research projects at Escuela de Estudios Árabes in Granada. There, I was able to approach the study of different buildings and landscapes that have finally had a substantial impact on the guidelines of my research profile. These are mainly based on the experience of my mentors, although after my postdoctoral experience I have also sought to develop the area by raising new interests or incorporating methodologies from other disciplines. In general terms, I pursue the improvement of dialogue between material and textual sources; the planimetric documentation and its open-access dissemination; the contextualised study of buildings (society, urbanism, territory); and the elaboration of chrono-typological catalogues.

As a result of my career, which has been developed by means of different fellowships and contracts, my interest is focused on the formation of socio-religious institutions in the medieval Islamic West and their architectural materialisation by attending to the particular characteristics of each type of institution, as well as their functions and their conceptual evolution over the centuries. In this way, it is possible to advance in the insight of these organisms that were conceived as a response to social, cultural and political pretensions. And, consistently, the artistic production at the service of these projects is equally important.

Therefore, this track has given shape to an original and promising line of research, by bridging the gap between the European and Arab scholarships, extending knowledge on Islamic architecture, and reinvigorating the field with the implementation of novel analytic methods. In this regard, it is noteworthy the production and spread of graphic material. The next pages will guide through my research career, by pointing out the main contributions and how they have played a part in the development of the field. Finally, the proposed research line is briefly outlined.

**Resumen del Currículum Vitae:**

My scientific profile stems from a heterogeneous background based on several lines (history of architecture, Arabic Language, and Archaeology) that have been developed professionally by studying the architecture of the Islamic West. I have a PhD in History and Arts (University of Granada) that has received the International Mention and the Extraordinary Award. So far, I have been affiliated to Escuela de Estudios Árabes in Granada, the Leibniz-Zentrum Moderner Orient in Berlin, the Museum of Islamic Art in Berlin, and the Istanbul Technical University.

I am an international expert on Islamic architecture in the Middle Ages and the Early Modern Age with particular attention to the Maghrib and al-Andalus. I have pursued the documentation of architectural heritage through my participation in national and international I+D+i projects (funded by public institutions and foundations), as well as various contracts from public and private entities. In this respect, my contribution has revealed buildings that were previously ignored and the results have become even more valuable in the face of current destructive interventions. Most of my efforts have been focused on religious buildings (mosques, madrasas and zawiyas), for which I have tried to progress on three specific subjects: the identification and characterisation of socio-religious ensembles in the Islamic West; the role and pretension of religious architecture in the shaping and transformation of urban settlements; and the functional and social dimension of the institutions fostered in these buildings. Apart from that, I have also contributed to the study of the agricultural royal estates in the periphery for the same geographical and historical context. For this subject I have documented outstanding landscapes and structures. In methodological terms, I have sought an objective conciliation between Arabic textual sources and material culture, as well as the implementation of scientific tools for the diachronic, spatial and landscape analysis of buildings. Noteworthy is the formulation of an innovative working system for the study of buildings in relation to the urban evolution.

This field has encouraged me to carry out several stays and teach specialized seminars and courses in international universities such as the Aga Khan University in London; American University in Cairo; Institut National des Sciences de L' Archéologie et du Patrimoine in Rabat; Boğaziçi University in Istanbul; and Freie University in Berlin. My results are being communicated in international conferences, often as invited lecturer, and through national and international publications. The research soundness of my career is also evident in my direction/participation in projects and events for dissemination, transfer of knowledge to public and private institutions (advice in restoration projects), educational engagement (initiation to research and guiding technical courses for young students), and activities for raising awareness on heritage among citizens. In order to ensure open access research, most of the produced plans on Islamic Architecture are available through digital repositories. Likewise, since my pre-doctoral stage, I have tried to prompt communication and two-way transfer with the Arab academic world by means of stays, seminars, collaborations, courses and academic advice.

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | FLORES MILITELLO, VICENTE |
| **Referencia:** | RYC2023-043969-I |
| **Correo Electrónico:** | vicente.floresmilitello@ugent.be |
| **Título:** | Sensorialidad e inmersión narrativa en la poesía épica tardoantigua |

**Resumen de la Memoria:**

Tras mis estudios doctorales en filología latina (2018, Universidad de Múnich; línea investigadora: poesía satírica de época imperial, siglos I-II d.C.), me desempeñé como investigador en el Instituto de Investigaciones Filológicas de la Universidad Nacional Autónoma de México (UNAM) (2019 a la fecha), con un proyecto sobre un poema épico panegírico tardoantiguo (Claudiano, "El consulado de Estilicón").

Desde noviembre de 2022 soy investigador postdoctoral en la Universidad de Gante, Bélgica, con un proyecto de tres años sobre narrativa cognitiva aplicada a textos poéticos tardoantiguos (Claudiano y Prudencio: finales siglo IV-inicios siglo V).

Mi línea de investigación es la literatura latina; particularmente, la poesía de época imperial (siglo I-III d.C.) y tardoantigua (siglos IV-VI d.C.).

La línea de investigación que propongo desarrollar se enfoca en el fenómeno conocido como inmersión narrativa en textos poéticos de épica tardoantigua (bajo "inmersión" entiendo la posibilidad que un texto da a quien lo lee de entrar, metafóricamente, en el mundo que se narra; dicha posibilidad se da a través de elementos léxicos que invitan de manera casi inconsciente a la mente de quien lee a experimentar con los propios sentidos lo que los personajes de una obra experimentan). Los objetivos generales son el análisis literario de pasajes de textos tardoantiguos (siglo IV d.C.) que constan de escenas que pueden caracterizarse como vívidas. El análisis se basa en una lectura atenta ("close reading") de dichas escenas con un foco sobre el carácter sensorial que muestran y que contribuye al potencial inmersivo del texto. En el centro de mi proyecto se encontraría el rol que juegan, en este contexto, distintos tipos de obras épicas, tanto de temática cristiana como de temática pagana/política. El foco del proyecto recae sobre textos latinos, aunque en un segundo plano, y como elemento de comparación, me concentraré en textos griegos y en representaciones de la cultura visual tardoantigua (p.e. mosaicos, sarcófagos) que presenten escenas con características análogas.

El proyecto es innovador pues tiene el valor, por un lado, de contribuir a potenciar el papel crucial de la literatura tardoantigua dentro de discursos actuales de teoría literaria; por el otro, ofrece, gracias a su interdisciplinariedad, una visión de conjunto sobre fenómenos estéticos que suceden en un momento clave en el desarrollo de la literatura occidental: el siglo IV representa un momento de cambio de paradigma a causa de la creciente importancia del cristianismo como religión oficial, sobre todo, entre las élites políticas, y la paradójica continuidad del lenguaje político tradicional romano ("pagano"), y marca un punto de transición hacia la Edad Media.

Los resultados de dicho análisis serán publicados en forma de artículos académicos y una monografía. Además de que se organizarán un workshop (taller) y un congreso internacional, que resultarán, a su vez, en la publicación de un volumen arbitrado de contribuciones (éste, idealmente en coautoría con colegas universitarios).

El proyecto ampliaría de manera sustancial nuestro entendimiento de la estética tardoantigua, y sentaría las bases para una discusión sobre la repercusión en el desarrollo de la literatura y la estética europea de la posteridad.

**Resumen del Currículum Vitae:**

Soy un estudioso de literatura antigua y de los fenómenos socioculturales en que ésta se desarrolla.

Realicé mis estudios de grado (licenciatura en Letras Clásicas) en la Universidad Nacional Autónoma de México (UNAM; 2006-2011). Posteriormente, me trasladé a Alemania, donde realicé mis estudios de Máster ("Magister Artium" en filología latina y griega así como en filología española) en la Universidad de Múnich (LMU München; 2012-2014). Gracias a una beca de excelencia académica de la Studienstiftung des deutschen Volkes, realicé, en aquella misma institución, mi doctorado ("Promotion" en filología latina; 2014-2018). Tema fue la representación literaria de tensiones sociales en autores satíricos romanos. Durante ese periodo, también me desempeñé como tutor de lengua española en el Centro de Idiomas de la universidad (LMU München).

En la primavera de 2019 publiqué mi monografía "tali dignus amico. Die Darstellung des 'patronus-cliens'-Verhältnisses bei Horaz, Martial und Juvenal" en la serie Classica Monacensia (Tubinga). Inmediatamente después tomé una posición como investigador de tiempo completo en el Instituto de Investigaciones Filológicas de la UNAM (2019 a la fecha). Allí no sólo desarrollé un proyecto de investigación sobre un poema épico del autor tardoantiguo Claudiano ("El consulado de Estilicón"; monografía en prensa), sino que también enseñé cursos de grado y máster y cubrí funciones académico-administrativas: fui secretario de redacción de la revista científica "Nova Tellus" (2020-2021), formé parte de gremios evaluadores, he sido lector y jurado evaluador de trabajos de fin de grado e incluso de doctorado. Asimismo, he participado en actividades académicas (congresos, seminarios) y de difusión general (charlas, lecturas de poesía, entrevistas).

Desde noviembre de 2022 soy investigador postdoctoral en la Universidad de Gante, Bélgica. Allí desarrollo un proyecto financiado por el Fondo de Investigación Especial (BOF) de aquella institución, sobre la representación de espectáculos y el fenómeno de inmersión en la obra de los poetas tardoantiguos Claudiano y Prudencio (siglos IV/V). En Gante he sido corresponsable de materia de máster (literatura antigua) y lector de trabajos de fin de grado. Igualmente, he coordinado grupos de estudiantes en actividades académicas y formo parte del gremio interno del departamento de literatura (área Latín).

He participado en diferentes congresos y talleres (workshops) internacionales como ponente. También he organizado un congreso internacional en cooperación con la Universidad de Edimburgo (diciembre 2023).

He realizado estancias de investigación en las universidades de Graz, Austria (2022) gracias a una beca del Grupo Coimbra, y Edimburgo (2023). Por invitación recibida, planeo actualmente una estancia en la Universidad de Harvard para el otoño de 2024.

Como línea de investigación secundaria, he trabajado y publicado en el área de tradición clásica; en particular, enfocada al humanismo europeo (siglos XIV-XVII) y al arte y literatura de la Nueva España (México). En este campo, he cooperado con las universidades de Halle y Colonia, Alemania.

A la par de publicaciones académicas, he publicado traducciones de obras en latín al español.

Formo parte de la Asociación Mexicana de Estudios Clásicos (AMEC) y de la sociedad científica alemana de la Antigüedad "Mommsen Gesellschaft".

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| **Área Temática:** | Cultura: filología, literatura y arte |
| **Nombre:** | ROJEWSKI , OSKAR |
| **Referencia:** | RYC2023-042704-I |
| **Correo Electrónico:** | o.rojewski@gmail.com |
| **Título:** | Estudio de pintura flamenca en relación con la corte de los Trastámara y los Austrias en los ss. XV y XVI |

**Resumen de la Memoria:**

Desde cursar el Master en Patrimonio Cultural y Conservación preventiva el interés de mis estudios estaba enfocado en las cuestiones artísticas relacionadas con patrocinio de las estructuras cortesanas sobre los pintores y artistas formados en los Países Bajos. La catalogación y la sistematización iconográfica de las obras artísticas fue mi primer enfoque de estudiar la pintura flamenca del siglo XV y XVI. Al definir el tema de la tesis doctoral y acceder al programa de doctorado he dedicado mis estudios a la documentación de la hipótesis relacionada con los oficios artísticos desempeñados por los sirvientes con el título cortesano valet de chambre en la corte de los Duques de Borgoña. A lo largo del proceso de investigación, aplicando métodos como el análisis heurístico, hermenéutico y epistemológico, con el estudio prosopográfico, ha sido posible identificar todos los personajes con el título analizado. Una vez concluida la primera parte del estudio, se ha seguido con la identificación del rol de los valets de chambre en la corte estudiando las principales crónicas cortesanas de los Países Bajos y buscando los resultados de su trabajo preservados en las colecciones museísticas contemporáneas. Asimismo, se ha podido documentar que los artistas con el título valet de chambre participaron en el proceso de construcción de la imagen del poder de su soberano, y la mayor parte de su obra artística estaba relacionada con las decoraciones efímeras de las fiestas celebradas en la corte.

Este estudio ha permitido establecer una metodología de trabajo universal que puede ser aplicada a otras cronologías y otros ámbitos cortesanos. Por tanto, para realizar los proyectos postdoctorales he seguido estudiando la cultura visual cortesana en relación con los cargos oficiales, seleccionando como caso de estudio la corte castellana y aragonesa al final del siglo XV, y la corte imperial de los Habsburgo en los tiempos de Carlos V. Asimismo, he realizado vaciados bibliográficos y luego archivísticos (principalmente Archivo General de Simancas, Archivo de la Real Academia de la Historia y Archivo Histórico Nacional en España, y el Archivo del Estado en Bélgica) para documentar las actividades de los artistas cortesanos. Gracias a la internacionalización y posibilidad de desarrollar estancias en el extranjero, he unido al estudio de las estructuras cortesanas y los artistas de la corte el método definido como Privacy studies desarrollado en la Universidad de Copenhague.

En los últimos años he concluido mi investigación publicando resultados en las revistas científicas acerca de la biografía de los pintores activos en la corte castellana y aragonesa, entre los cuales quiero destacar Michel Sittow y Felipe Morros. Ambos, según mi análisis de los documentos y las obras, han llevado a la Península Ibérica las soluciones técnicas e iconográficas del arte relacionado con los Primitivos Flamencos. Además, ha sido posible documentar información acerca de sus posibles colaboraciones y obras realizadas conjuntamente con Juan de Flandes. Por lo que concierne a los resultados de mis estudios acerca del siglo XVI, ha sido posible identificar las obras de Marcelus Coffermans en las colecciones públicas en España, y ampliar el conocimiento respecto al comercio de obras de arte entre la escuela de Amberes y la corte peninsular.

**Resumen del Currículum Vitae:**

Durante el grado en Historia del Arte en la Universidad de Silesia en Polonia que realicé entre los años 2010 y 2013, participé en el programa Erasmus+ atendiendo los cursos en la Universidad de Valencia en España. Asimismo, una vez concluido el grado me matriculé al Master de Patrimonio Cultural y Conservación Preventiva de la misma universidad. Acabado el master, también gracias al programa Erasmus, he podido realizar las prácticas profesionales en la Biblioteca Polaca de Londres, catalogando su colección de grabados. En septiembre del 2014 solicité la ayuda predoctoral para realizar una tesis bajo tutoría de prof. Víctor Mínguez y la prof. ª Inmaculada Rodríguez Moya en la Universidad Jaime I, en el programa interuniversitario de doctorado entre Castellón de la Plana y Valencia. Una vez obtenida la ayuda al año siguiente, he podido incorporarme en el grupo Iconografía e Historia del Arte, con el que sigo colaborando como investigador. Durante mi periodo de formación predoctoral he podido realizar tres estancias breves y una de seis meses en la Universidad Católica de Lovaina en Bélgica (en 2016), en el Departamento de Humanidades, en el Área de Historia de Literatura, bajo tutoría de la prof. ª Agnès Guiderdoni y la prof. ª Tania van Hemelryck. He concluido la tesis doctoral en marzo de 2018, y seguí vinculado con la Universidad Jaime I como profesor asociado. En junio del mismo año conseguí el contrato en la Universidad de Oxford para concluir un proyecto de investigación, donde he desarrollado un estudio prosopográfico, junto a la prof. ª Natalia Nowakowska. Al final del 2018, he concursado la plaza de Profesor Ayudante Doctor en la Universidad de Silesia en Katowice que gané, incorporándome al Departamento de Historia del Arte.

En octubre de 2019, solicitando la excedencia en mi puesto de trabajo, me he incorporado de nuevo a la Universidad Jaime I como becario postdcotoral con la ayuda del programa de la Generalitat Valenciana. Entre las condiciones de la ayuda estaba la realización de una estancia en el centro extranjero durante no menos de 18 meses. Asimismo, en enero de 2020 inicié mi formación postdoctoral en la Universidad de Copenhague en la Facultad de Teología, vinculado con el centro de Excelencia en Investigación Centre for Privacy Studies, permaneciendo allí hasta diciembre del 2021, bajo la dirección de la prof. ª Mette Birkedal-Brunn.

En el último año de mi primer contrato postdoctoral, he solicitado la ayuda para atracción de joven talento con el grupo CINTER de la Universidad Rey Juan Carlos, que he obtenido en febrero de 2022, incorporándome a este equipo de trabajo, bajo dirección del prof. José Eloy Hortal Muñoz, donde sigo desarrollando mi proyecto de investigación.

A lo largo de los años, desde mi formación en el master, hasta la segunda fase postdocotral, he podido publicar los resultados de mis estudios en tres monografías (una de un autor, una de varios autores y una editada), nueve artículos en revistas académicas con la revisión por pares ciegos, doce capítulos en monografías editadas por otros investigadores y nueve reseñas de eventos culturales o de la bibliografía sobre Historia del Arte. Además, he participado en veinticuatro congresos preparando presentaciones de mis resultados de investigación y en once seminarios, que tuvieron lugar en once países en Europa.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Cultura: filología, literatura y arte
**Nombre:** BALDWIN , OLIVER
**Referencia:** RYC2023-043021-I
**Correo Electrónico:** oliver.a.baldwin@gmail.com
**Título:** Staging the unstageable: Senecan tragedy on stage

**Resumen de la Memoria:**

The project I present to the Ramón y Cajal fellowship, Staging the unstageable, will analyse the global performance history of Senecan tragedy in order to ascertain how Seneca's tragedies have served as a platform for new and experimental theatrical languages, from the theatre of cruelty and ritualism to post-dramatic stagings, as well as the importance of Senecan horror, psychological obscureness and the performance before audiences of the supernatural and deaths, to 20th and 21st century theatre. The project will also explore issues regarding gender, power and identity explored in the productions analysed. Staging the unstageable' s chronological framework begins with Pitoëff' s Medea (Paris, 1932) and ends with Stone' s Phaedra (London, 2023), spanning almost a century of stagings of Senecan tragedy, including work by Artaud, Peter Brook, Jorge Lavelli, María Casares, Ronconi, Andrei Serban, Hugo Claus, Caryl Churchill, Sarah Kane, Warlikowski, Anne Washburn and García Wehbi. The project will also allow for insights into the Senecan stageability debate by exploring how the productions discussed confront, resolve or adapt Senecan tragedy' s theatrical challenges.

This project will have a high academic impact in several disciplines, including Classics, Theatre Studies, Cultural History, Comparative Literature, Gender Studies and Aesthetics, given the myriad ways in which it explores the relationship between Senecan tragedy and the international theatrical scene of the 20th and 21st centuries. Staging the unstageable will be particularly productive for Classical Reception and performance histories of ancient drama, since it will focus on a phenomenon that has received no detailed attention beyond a few key performances in articles or monographs that are focused on areas that are concomitant or entirely different to that of this project. The project will also serve theatre practitioners wishing to stage Senecan tragedy in the future, as it will detail diverse dramaturgical and scenic strategies in confronting the texts' difficulties.

My own experience and work as a scholar in stage receptions of Greek and Senecan tragedy informs my choice as well as positions me in a competent situation to undertake this project. Staging the unstageable is, in part, a continuation of my own PhD thesis, under the supervision of Edith Hall at KCL, for which I received a ' Pass with no corrections' (highest UK PhD mark) as well as a Best Thesis Prize from the Association of Hispanists of Great Britain and Ireland. This research resulted in the book Seneca' s Medea and Republican Spain: Performing the Nation (2022), as well as conference papers and published articles. My work as a scholar of stage receptions of ancient tragedy has been further recognised with a British Academy Postdoctoral Fellowship hosted at the University of Reading to undertake Queer Tragedy, an international performance history (1969- 2019) of LGBTQI+ stage versions of Graeco-Roman tragedy. My work has awarded me an internationally recognised profile in the performance of ancient tragedy, as evidenced by, among other things, an FCT (Portugal) Junior Researcher Fellowship. The next step in consolidating my research profile is the present project, Staging the unsteageable, and the Ramón y Cajal fellowship, to which I bring my experience, knowledge and skills.

**Resumen del Currículum Vitae:**

My recognised research follows three main axes: the use of ancient Rome and Greece in political, ontological and gender-sexual discourses; the staging of ancient tragedy as artistic experimentation; and Classical philology. My interdisciplinary research has been recognised with a Best Thesis Prize, a British Academy Postdoctoral Fellowship and a FCT fellowship.

My research career began with my PhD on the 1933 staging of Seneca' s Medea in Spain, supervised by Prof. Edith Hall at KCL, focusing on the performance of ancient tragedy during the Second Spanish Republic, encompassing themes such as nationalism, cultural dissemination, fascism and liberalism, feminism, secularism and theatrical aesthetics. After gaining a ' Pass with no corrections' (highest UK PhD mark), the Association of Hispanists of Great Britain and Ireland awarded it its 2019 Best Thesis Prize, resulting in the monograph Seneca' s Medea and Republican Spain: Performing the Nation (Tamesis, 2022). In the area of Spanish and Spanish-speaking Classical receptions I also published two peer-reviewed articles and three chapters, alongside one forthcoming peer-reviewed article and two forthcoming chapters. This has granted me international recognition as a specialist this area, evidenced by the granting of a Portuguese FCT Junior Researcher Fellowship and invitations to talk at Université Paris-7, UNAM and the Universidad de Valencia and to review for Estudios Clásicos, Euphrosyne and International Journal of the Classical Tradition.

My work has continued with a British Academy Postdoctoral Fellowship at the University of Reading, to conduct Queer Tragedy, an international performance history (1969-2019) of LGBTQI+ stage versions of Graeco-Roman tragedy. The project has produced peer-reviewed articles on a Spanish gay Medea (2020) and a Trojan Women-inspired queer family and AIDS (forthcoming), as well as a monograph and four articles in press or preparation, a database and a website. Queer Tragedy has had substantial impact in international academic communities, through invited talks at Oxford, UNAM, RHUL, Durham, UCSB and University of Lisbon, and through conference papers at eight separate conferences. I have also organised an international and interdisciplinary conference on queer receptions of tragedy, Tragedy Queered, resulting in substantial academic impact. As a result of my work, I was invited by Ghent University to participate in a roundtable on Queer Studies and Classics and to write a chapter on Rhesus and queer theory in Queer Euripides (2022), which has had great impact in Classics and beyond.

I have disseminated my work socially through interviews to the BBC and the Broken Futures podcast about Queer Tragedy; talks to schools on Homer, Greek tragedy and theatre; and my participation in the documentaries La Balada Perdida (dir. M. Ruiz, 2022) and Making the play (dir. A. Ygoa, 2018). I have also worked as consultant in Proyecto Homero (2016) and ENEIDA (2021) by LaJoven in Madrid, and a feminist play on Dido by theatre director Magdalena Zira. I have been invited speaker in events such as KCL' s 2021 Greek play, From the Machine, and Antic-queer-tea (Being Human Festival; organised by me). I have delivered the first ever LGBT+ Month Public Lecture at the University of Reading in February 2023, and a Trans Awareness Week 2023 talk at St Cuthbert' s Society (Durham).

**Área Temática:**      **Derecho**
**Nombre:**      SOZZO  MEJICO, MÁXIMO EMILIANO
**Referencia:**      RYC2023-044616-I
**Correo Electrónico:**      msozzo80@gmail.com
**Título:**      Contrastes Punitivos. Hacia una comparación de las transformaciones penales entre el Norte y el Sur Globales.

## Resumen de la Memoria:

A lo largo de mi trayectoria he desarrollado diversas líneas de investigación. En primer lugar, he estudiado la historia de la relación entre la locura y el delito y de la criminología en Argentina y América Latina. En mi doctorado realicé una investigación histórica sobre la relación entre la locura y el delito en la Argentina durante el siglo XIX que fue publicada como libro en 2015, bajo el titulo Locura y Crimen (Didot). A partir de la misma, desarrollé una serie de exploraciones sobre la circulación de los saberes sobre la cuestión criminal desde y hacia Argentina y América Latina en el pasado remoto y reciente. En esta dirección, se destaca el libro que compilé con Caimari, Historias de la Cuestión Criminal en América Latina (Prohistoria, 2017).

En segundo lugar, he venido trabajando sobre el debate teórico acerca de la criminología del sur y la criminología decolonial. En este marco he producido diversos textos que se han vuelto ejes de la discusión global destacando el libro de 2019 Southern Criminology (Routledge) escrito junto con Carrington, Hogg, Scott y Walters. También han sido muy relevantes el Handbook on Criminology and the Global South de 2018 (Palgrave, editado junto con Carrington, Hogg y Scott) y Decolonising the Criminal Question de 2023 (Oxford University Press, editado junto con Aliverti, Chamberlen y Carvalho).

En tercer lugar, he investigado las transformaciones de la penalidad y de la prisión en Argentina y América Latina. Sobre esta temática he concentrado gran parte de mis esfuerzos en los últimos años, produciendo textos que se han transformado en puntos de referencia para el debate académico, como el libro colectivo que compilé en 2016 Penalidad y postneoliberalismo en América del Sur (CLACSO) -que fue traducido al portugués e inglés en 2017. También ha sido muy relevante mi libro La Inflación Punitiva. Un análisis comparativo de las transformaciones del derecho penal en América Latina (1990-2015) (FLACSOEcuador, 2017). Y más recientemente, el libro que he compilado en inglés, Prisons, Inmates and Governance in Latin America (Palgrave, 2022).

Además, a lo largo de mi trayectoria académica he trabajado sobre temas vinculados a la policía (uso de la fuerza, reforma, policía de la violencia de género, mujeres policías) así como a la reforma de la justicia penal (prisión preventiva, mecanismos de condena sin juicio) en América Latina. En esta última dirección, se destaca el libro compilado con Langer, Justicia Penal y mecanismos de condena sin juicio. Estudios sobre América Latina (Marcial Pons, 2023).

A partir de esta ayuda pretendo desarrollar un nuevo trabajo de investigación que compare las trayectorias recientes de la política penal en España y Portugal con las de Argentina y Brasil, atravesando de este modo las fronteras entre el Norte y el Sur Globales. Hasta aquí los esfuerzos comparativos en los estudios sobre castigo y sociedad se han concentrado especialmente en el Norte Global, por lo que esta investigación generará una innovación muy importante. Se busca dar cuenta de las condiciones y procesos que han generado en los últimos años tendencias penales contrastantes entre estos contextos nacionales: hacia la estabilidad o reducción de la punitividad -Portugal y España- y hacia el aumento de la punitividad -Brasil y Argentina.

## Resumen del Currículum Vitae:

Soy Profesor Titular de Sociología del Derecho y Criminología de la Universidad Nacional del Litoral desde 2009. He liderado en esta casa de estudios la Maestría en Criminología desde 2009, el Programa Delito y Sociedad desde 2006 -que lleva adelante proyectos de extensión e investigación- así como el Programa de Educación Universitaria en Prisiones desde 2004 -que brinda la oportunidad a las personas privadas de su libertad de realizar estudios universitarios.

Con más de dos décadas de experiencia en investigación en el campo criminológico, que se ha traducido en una vasta producción intelectual, me he establecido como una figura de referencia internacional en este campo.  He publicado 20 libros: 5 como autor (todos ellos en español, 1 de los cuales ha sido traducido al portugués), 1 como coautor (en inglés) y 14 libros como editor/compilador y coautor (5 en inglés y 9 en español, 2 de los cuales han sido traducidos al portugués). He publicado también 56 capítulos de libros en español, inglés, italiano y portugués. Y 64 artículos en revistas científicas con revisión de pares en español, inglés, italiano, chino y portugués. Mi índice H en Google Scholar es 35, en Scopus es 10 y en Web of Science es 7.

Actualmente, soy Director de la revista Delito y Sociedad, una de las publicaciones periódicas en español más antiguas y reconocidas en esta área de estudios, y Associate Editor de Punishment and Society, reconocida como la revista científica más prestigiosa en los estudios sociales sobre la penalidad a nivel global

Mi trayectoria académica ha tenido un amplio grado de internacionalización, con 20 estancias prolongadas de investigación y docencia en universidades europeas, americanas y oceánicas -entre otras, Nueva York, Edimburgo, Toronto, Barcelona y Boloña.

Soy Adjunct Professor -en forma honoraria- de la School of Justice de la Queensland University of Technology (Australia) desde 2013, de la School of Law and Society de la University of the Sunshine Coast (Australia) desde 2022 y del Department of Law and Legal Studies de la Universidad Carleton (Canada) desde 2023. He recibido diversas Fellowships, entre las que se destaca la Straus Fellowship de la School of Law de la University of New York (2010/2011).

He sido dos veces Coordinador de un Grupo de Trabajo del Consejo Latinoamericano de Ciencias Sociales:" Sistema penal y cambio social" (2016-2019) y "Postneoliberalismo y control del delito en América del Sur" (CLACSO). Y con R. Sparks he coordinado dos International Research Collaboratives de la Law and Society Association: "Punishment and Democratic Politics. Comparative and International Perspectives" (2016-2019) y "Punishment and Society: International and Comparative Perspectives between the Global North and South" (2021-2023).

He participado como ponente invitado en 250 congresos en Argentina, Uruguay, Chile, Perú, Brasil, Ecuador, Colombia, Venezuela, México, El Salvador, Estados Unidos de América, Canadá, Australia, Italia, España, Portugal, Hungría, Alemania, Países Bajos, Bélgica, Noruega y Reino Unido. He sido

Investigador Principal de 30 proyectos de investigación, financiados por diversas agencias gubernamentales argentinas y extranjeras. Y he dirigido 3 tesis de doctorado concluidas y actualmente superviso 9, además he dirigido 16 tesis de maestría y actualmente superviso 6 en elaboración.

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| **Área Temática:** | **Derecho** |
| **Nombre:** | BEDNARZ , ZOFIA BRONISLAWA |
| **Referencia:** | RYC2023-043703-I |
| **Correo Electrónico:** | zofiabednarz@gmail.com |
| **Título:** | Financial products governance regimes and consumer profiling: preventing the harms of AI and promoting good data and AI governance in the financial industry |

**Resumen de la Memoria:**

Guaranteeing a sufficient level of consumer protection in the context of financial services is a notoriously complicated task for policymakers and regulators. Policymakers in a number of jurisdictions have started turning to product governance regimes, placing an obligation on financial firms to determine the characteristics of consumers to whom they offer financial products. Financial institutions are likely using advanced data analytics, including AI models, to comply with these duties, in effect engaging in data profiling of consumers. While increasingly precise, such practices present harms to consumers, even when non-personal data is used. I propose a project with three main objectives: (1) to conceptualise consumer harms of non-personal data collection and use by financial firms; (2) to assess the effectiveness of financial products governance regimes in preventing the mis-selling of financial products and the risk of them encouraging data profiling of consumers; and (3) to evaluate the AI and data governance practices of financial firms (including incumbents and FinTechs). Drawing on doctrinal analysis, comparative legal analysis and empirical methodology, the research will not only deliver a novel conceptual framework of non-personal information harms, but also propose solutions to prevent these harms, improve the protection of financial consumers, and set out best practices of AI and data governance for financial industry, ultimately benefiting the market and consumers alike.

On top of the academic dissemination of the results of the proposed research in the form of publications, congresses participation and events organisation, the outcomes of the research will translate into impact through engagement with stakeholders, through the following pathways: (1) forming recommendations for policymakers and regulators on necessary reforms of privacy and data protection regimes / new AI regulation; on the fitness-for-purpose of the financial products governance regimes and their interaction with data / AI rules; and on preventing harms beyond privacy / data protection; (2) proposing new ways of thinking about data harms in legal research, thus setting foundations for new lines of research, both in relation to financial services and in other areas; (3) informing the stakeholders, advocacy groups, and broader public about common AI / data practices, raising public awareness of potential issues; (4) advising financial institutions as to new likely legal and regulatory developments; and (5) promoting culture of safe and responsible AI and data governance, instead of the culture of compliance for financial institutions, including FinTechs.

The study of the complex financial law rules and the limits of the privacy protection regimes, together with the empirical analysis of the commercial practice represents a significant challenge, not only because it requires expertise in diverse areas of law, including: financial services, consumer protection, as well as AI and data regulation, but also due to the fast-paced advancements and changes of the technology, the commercial practice of the financial industry, and the law and regulation. My trajectory in related areas has thoroughly prepared me for carrying out the proposed research, with relevant skills and experience in applying the proposed methodology throughout my academic career.

**Resumen del Currículum Vitae:**

I completed my PhD (European mention, defended summa cum laude) at the University of Málaga (UMA), Spain, in 2017, and started working as a sessional lecturer (PSI) at the Department of Commercial Law at the Universidad de Málaga (UMA), engaging in both research and teaching. I left my position at UMA in early 2020 to pursue a 2-year postdoctoral fellowship (research-only placement) at the Centre for Law, Markets and Regulation (CLMR) at the Faculty of Law and Justice at the University of New South Wales (UNSW), Australia, at the Law School consistently ranked within 15 best law faculties globally. In early 2022, I was successful at securing a full-time continuing tenure-track position as a Lecturer in Commercial and Corporate Law at one of the most prestigious law schools in the world: the University of Sydney Law School (ranked within the top 20 law faculties globally).

My research, which falls within the area of commercial and corporate law, covers three main lines: commercial contracts, with specific focus on consumer protection; company law, in particular the position of company directors, as well as shareholdings and members' rights; and financial services law, with main interest in insurance law. The connecting points between these lines is (1) the methodology I often apply, which is the comparative legal analysis that I have been able to develop thanks to my extensive studies and work in both civil and common law systems, and (2) the investigation of the implications of the emerging technologies in these areas of commercial and corporate law.

I have a very strong track record of work published in English and Spanish language in the leading national and international law journals (15 articles), as well as peer-reviewed book chapters (10 book chapters), in addition to two research books: a monograph (2019) with Marcial Pons and an edited collection (2023) with Cambridge University Press. My trajectory has also been marked with collaborations, both within academia and outside of it, dissemination of the research results to the wider public and translation of those results into actionable recommendations for policymakers, regulators and the industry. I have been an active member of research centres, such as the CLMR UNSW and the Allens Hub for Technology, Law and Innovation, and an investigator on various projects and grants, including the Australian Research Council Centre of Excellence for Automated Decision-Making and Society (ARC Centre for ADM+S), and chief investigator on industry-sponsored grants and contracts (such as Santander Financial Institute grant of 12.000 EUR, National Australia Bank research contract of 8.000 AUD, OECD contract to present my research of 1.500 USD, Agencia de Defensa de la Competencia de Andalucía research contract of 3.000 EUR). I have engaged with stakeholders such as professional lawyers' associations, consumer advocacy groups, industry and government and international organizations. I published popular science articles (The Conversation, European Corporate Governance Institute Technology & Governance series), and my research has attracted attention of the media (including the leading Australian newspaper, The Sydney Morning Herald and the Australia's national ABC radio) and allowed me to contribute to reports for governments related to law reform.

**Área Temática:**    **Derecho**
**Nombre:**    VEGH  WEIS, VALERIA
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**Título:**    Dra

**Resumen de la Memoria:**

Mis aportes a la investigación se ubican en la intersección entre el derecho y las ciencias sociales, destacándose los siguientes: (1) en el campo de la justicia transicional, he desarrollado teóricamente la noción de procesos "liderados" por las víctimas para cuestionar las limitaciones de los enfoques "centrados" en las víctimas. Desde una perspectiva decolonial con foco en la agencia de las víctimas, el concepto de "liderazgo" aboga por la resignificación de la imagen subyugada de los sobrevivientes y arroja luz sobre su potencial para promover cambios sociales y jurídicos tras períodos de violencia masiva; (2) En mi tesis doctoral, desarrollé una conceptualización histórica de la "selectividad penal", revelando cómo los sistemas de justicia penal han reforzado la desigualdad a lo largo de la historia moderna. Explorando múltiples dimensiones como la clase, el género, la religión y la etnia, rastreé este fenómeno hasta el siglo XV, centrándome en Europa Occidental y Estados Unidos. Utilizando las herramientas conceptuales acuñadas en mi disertación, trabajé posteriormente en distintos estudios de caso centrados en la "sobrecriminalización" de las protestas y la "infracriminalización" de los delitos contra el medio ambiente. (3) También me he concentrado en las contribuciones latinoamericanas al derecho penal internacional, en particular en lo relativo a las desapariciones forzadas.

Actualmente trabajo como investigadora en la Universidad de Constanza en el marco de un Zukunftskolleg (un programa interdisciplinar de cinco años de duración que ofrece generosos fondos para promover la investigación de vanguardia). Mi investigación se basa en las desagregadas contribuciones que se han hecho desde el derecho internacional, el derecho penal internacional, los estudios sobre movimientos sociales, estudios sobre paz y conflicto, y los trabajos de justicia transicional, entre otras áreas de estudio, a los efectos de construir un innovador análisis sobre los procesos de resistencia frente a episodios de violencia masiva. Al mismo tiempo, me encuentro llevando a cabo importantes colaboraciones interdisciplinarias. Por ejemplo, co-coordino una red de científicos sociales del Reino Unido, Canadá y Francia que trabajan en estrategias socio-jurídicas contra la criminalización de la protesta.

La línea de investigación que desarrollaré durante el periodo de financiación Ramón y Cajal se propone construir sobre los aportes teóricos que he realizado hasta el momento para abrir un nuevo paradigma en los estudios sobre delitos internacionales. En concreto, el objetivo del proyecto será probar empíricamente si (y cómo) el liderazgo de las víctimas permite avanzar más eficazmente en la búsqueda de verdad, justicia, reparaciones y garantías de no repetición en los procesos transicionales abiertos luego de la comisión de delitos internacionales.

La investigación utilizará lo que denominaré "las 3Cs", que consisten en C1: Collation (revisión sistemática de la literatura), C2: Cases (estudio de casos individuales) y C3: Comparisson (estudio comparativo de casos). Dentro de C2, el diseño involucra otras 4Cs basadas en un diseño mixto: Ci Context (estudio participativo con las víctimas), Cii correlation (regresión logística), Ciii contribution (rastreo de procesos) y Civ connection (estudio de redes).

**Resumen del Currículum Vitae:**

Soy Postdoctora y Doctora en Derecho además de Especialista en Derecho Penal por la Universidad de Buenos Aires (UBA) y Magister en Derecho Internacional Público por la Universidad de Nueva York (NYU), títulos que he obtenido con calificaciones sobresalientes. Actualmente trabajo como investigadora en la Universidad de Constanza en Alemania y como docente de criminología y justicia transicional en la UBA y en la Universidad Nacional de Quilmes en Argentina. Asimismo, coordino y participo en proyectos de investigación socio-jurídicos con prestigiosos colegas de América Latina y Europa, formo parte del comité editorial de diversas revistas y me desempeño como Vice-Presidenta de la Asociación Latinoamericana de Criminología y Desarrollo Social.

Previamente he sido investigadora postdoctoral por la Alexander von Humboldt Stiftung en Berlín, investigadora postdoctoral e investigadora asociada del Instituto Max Planck de Historia del Derecho y Teoría del Derecho en la ciudad de Frankfurt, investigadora postdoctoral en la Universidad Libre de Berlin y asistente de investigación en la Universidad de Nueva York. Asimismo, he sido invitada como docente en prestigiosas universidades en Europa, América Latina, Kenia y Estados Unidos.

Mi libro Marxism and Criminology: A History of Penal Selectivity (Brill 2017; Haymarket Books 2018) recibió los premios Choice Book Award por la American Library Association (2017) y el Outstanding Book Award dado por la Academy of Criminal Justice Sciences (2019). Asimismo, soy autora del libro Criminalization of Activism (Routledge 2021) y co-autora de Bienvenidos al Lawfare escrito junto a Raúl Zaffaroni y Cristina Caamaño y prologado por el actual presidente de Brasil Inacio Lula da Silva (Capital Intelectual 2020, Tirant Le Blanch 2022, Brill 2023). También he publicado más de 70 capítulos de libros y artículos en revistas de alto impacto en inglés, español, alemán y portugués, abarcando una amplia gama de perspectivas críticas sobre el sistema de justicia penal, los delitos ambientales, la protesta social y los delitos internacionales.

Mi formación y experiencia académica se combina con una larga trayectoria profesional en el campo del derecho, que incluye mi paso por la Comisión Interamericana de Derechos Humanos en Estados Unidos, donde estuve a cargo de redactar los Principios de la Memoria en las Américas; el Centro Internacional para la Justicia Transicional de Kenia, donde diseñé el programa de reparaciones por los crímenes cometidos durante los episodios de violencia e 2007; y en la Defensoría Pública en Argentina, donde coordiné un equipo de psicólogos, trabajadores sociales y abogados abocados a la rehabilitación de personas encarceladas. En conjunto, cuento con quince años de experiencia en el poder judicial argentino y organismos internacionales.

He recibido financiación de destacadas instituciones, como Fulbright, la Universidad de Nueva York, la Fundación Alexander von Humboldt, la Universidad de Constanza, la Unión Europea y el Ministerio de Educación de Argentina. También he recibido varios premios de gran prestigio, entre los que se destaca el Critical Criminologist of the Year Award en 2021 otorgado por la American Society of Criminology, la asociación de criminología más importante del mundo.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Derecho** |
| **Nombre:** | RABANOS , JULIETA AGUSTINA |
| **Referencia:** | RYC2023-043168-I |
| **Correo Electrónico:** | julietarabanos@gmail.com |
| **Título:** | Contemporary Challenges to Authority |

**Resumen de la Memoria:**

My research trajectory has been developed along three main interrelated lines: 1) authority and law; 2) legal systems and norms; and 3) coercion and the (Rule of) Law.

2.1. Authority and Law. This main line of research started in my master programme and continued throughout my PhD and postdoctoral studies. Within the main line of research, two distinctive sublines were developed: the models of (discourse on) authority (I) and legal methodology and legal realism (II). Within this line of research, I purposed (1) to offer some clarification in the contemporary debate on authority, as it is sometimes unclear what the disagreement (if any) is about; (2) to show that there are some common patterns on how we can approach authority which can be represented as general discourse models, and thus analysed and compared; (3) to inquire what the most adequate discourse model to approach authority is if we support a more neutral, more powerful description-wise, and less-assumption-dependent legal theory and philosophy.

2.2. Legal Systems and Norms. Within this second line of research, I offered a defence of the possibility of legal norms as products of non-voluntary, non-intentional acts of (some) legal authorities (based on Olivecrona' s account of legal norms) and suggested the possible usefulness of the category of independent imperatives for contemporary legal philosophy; I endeavoured to fix the lack of attention and interest in legal theory and legal dogmatics regarding the evolution of legal systems and offered an overview of the evolution of the concept of legal system, and I critically analyse whether an evolutionary theory of legal systems –and some general evolutionary principles– can be reconstructed and laid down for the analysis both of the past, the present, and the future of legal systems.

2.3. Coercion and the (Rule of) Law. Within this line, I advance a defence of the coercion-dependence existence and coercion-dependence functionality of law when considering law as an artefact with a specific function. I argue that the fulfilment of law' s function(s) depends both on its existence and on its possession of a certain property that enables the achievement of that end, especially when the functions are related to behaviour-guidance and coordination-solving.

The proposed line of research, titled "Contemporary Challenges to Authority", aims to fix the deficits classic and contemporary discourses on authority have when faced with real-life challenges. Authority in law has been traditionally conceived as (1) public authority, (2) claiming political, practical, and comprehensive authority over (3) natural persons within (4) a certain national (physical) jurisdiction context. However, the increasing complexity of contemporary political and legal phenomena over the last decades has given rise to a very different picture. the main objective of this proposed line of research is thereby to develop a comprehensive and diversified approach to authority, capable of provide the necessary tools for analysing and proposing responses to several theoretical and practical challenges concerning not only traditional authority in traditional contexts, but in particular non-traditional authority and non-traditional contexts.

**Resumen del Currículum Vitae:**

My research trajectory started as a teaching assistant of a "General Theory of Law" course during my undergraduate studies, at the University of Buenos Aires. Before starting my PhD, I obtained a bachelor' s in Law at the University of Buenos Aires (2012) and a master' s degree in Global Rule of Law & Constitutional Democracy at the University of Genova (2015), while I was working as a full-time legislative aide at the Argentine Federal Chamber of Deputies (2012-2015). After the completion of my PhD studies at the end of 2020 (2016-2020), I was awarded two postdoctoral fellowships at the University of Genoa, Italy (2021-2023). These initial fellowships allowed me the opportunity to further my research career by writing several articles (in several languages) which were published in peer-reviewed journals, and a forthcoming monograph on contemporary models of authority (see "Scientific Contributions" and Part C). In 2021, I also started also working as a Collaborating Professor at U. Alberto Hurtado, Chile (2021-present). Currently, I am a postdoctoral fellow at the University of Belgrade within the EU "ALF" (2023-present). conducting research on authority, coercion, and artificial intelligence, and coordinating a subproject within ALF Project called PRALF.

In the period from the completion of my PhD studies to the present, I have: (i) been working as a professor, invited professor and teaching assistant both in graduate and postgraduate courses at different universities in Latin America and Italy; (ii) being main drafter and planner in two successful institutional European research projects (VIROL and ALF), as well a technical advisor, researcher and teacher within them (see C3-CVA and 4.1-Memoria); (iii) been awarded different institutional grants to continue my research (not only the fellowships, but also for research stays) (see point "Funding" below and 3.1-Memoria); (iv) being responsible for an ongoing European subproject (within a main European project) (see 4.1-Memoria); (v) acquired unique expertise in the research areas of authority, legal systems and norms, and coercion and the (Rule of) Law; (vi) developed collaborative work with other legal philosophers, both in publications, research, the founding of and participation in reading groups and research groups (see C.1); (vii) edited and published books, book chapters and journal articles (see C1 and 2-Memoria); (viii) actively participated in the dissemination of both academic outputs and activities; (ix) organised several international congresses and special workshops (see 3.2-Memoria); (x) trained and mentor early career researchers, among other things.

A brief overview of my most relevant scientific contributions can be found in Point C.1-CVA, and a full description of them can be found in Point 2-Memoria. My research has been developed along three main interrelated lines: 1) authority and law; 2) legal systems and norms; and 3) coercion and

the (Rule of) Law. The resulting contributions are a forthcoming book on contemporary models of authority, as well as several articles and book chapters, all of which are published in renowned and well-indexed scientific journals and publishers, and I have made sure a copy of each of them has been made available to the public through public scientific repositories.

**Área Temática:**     **Derecho**
**Nombre:**     PRUSINOWSKA , MONIKA
**Referencia:**     RYC2023-043249-I
**Correo Electrónico:**     prusinowska.monika@gmail.com
**Título:**     International Law: Encounter with China
**Resumen de la Memoria:**

My research so far has evolved around decoding China and its legal developments in terms of variety of interactions experienced by the rest of the world engaging with China, and EU in particular. My work focuses in this context have been ranging from investment, trade and related disputes to climate change mitigation efforts. It looks at both domestic law contexts in China as well China's capabilities and actions in shaping the rules of international law.

I have worked with leading institutions both in Europe and China, including Oxford University China Centre, China Law and Development; China-EU School of Law in Beijing and University of Barcelona. My work has also benefited from a wide exposure to law practice: I am a qualified attorney, I worked as a lawyer in one of the biggest law firms in China, I lectured at the Embassy of Poland in Beijing, and worked and researched with variety of dispute resolution centres.

I have authored and co-authored book chapters and academic articles, with, among others, Oxford University Press, Edward Elgar Publishing and Cambridge University Press. I was also invited to prepare law-related publications for the institutions such as the European Commission, the Embassy of Poland in Beijing and the American Society of International Law. I have directed my work to both academic and professional circles. My work has been cited by scholars and practitioners from Europe, China, US and beyond. A significant part of my work is freely accessible.

Based on my work done so far and ideas I have been currently exploring, I would like to develop the following line of research within the Ramón y Cajal Fellowship: "There is no Planet B: International law and China in XXI Century: Selected Questions of Environmental Protection and Sustainable Development".

In the 21st century, China has emerged as a global leader and is increasingly playing a significant role in shaping international law, particularly in the areas of environmental protection and sustainable development. As China's economic and political influence continues to grow, it is crucial to examine how China's engagement in these area impacts international law and the pursuit of global environmental and sustainability goals. The understanding is essential for designing the informed policies vis-à-vis China (incl. by EU), as well as navigating the space for collaboration with China in addressing the key challenges of the current century. My research will, therefore, explore the complex interplay between international law, China, environmental protection, and the questions of sustainability, with a focus on the following key questions:

1.     How is China's domestic legal framework evolving to address environmental challenges and promote sustainable development? How is China engaging with international framework and agreements in this respect?
2.     What are related legal implications when it comes to China's foreign investment and trade in the Global South, in particular in the region of Latin America and the Caribbean (LAC)?
3.     What are the potential challenges and opportunities given China's attempt to shape the future of international law in the context of environmental protection and sustainable development? How can the European Union (EU) and other stakeholders best prepare to engage in the meaningful dialogue with China in this regard?

**Resumen del Currículum Vitae:**

Mission: For nearly a decade (2011-2019), I was living, studying, researching and working both as an academic and law practitioner in Asia, predominantly in China. I have obtained law degrees in Europe and China and became fluent in Mandarin. My Phd thesis defended at the University of Hamburg dealt with the questions of dispute resolution in China. This all has prepared me to better understand China. I then decided to return to Europe with a mission to decode China, its legal system, and its interaction with the rest of the world to non-Chinese audience. My pursuit is to help various stakeholders understand China in order to better engage with it and make informed decisions. I believe that building bridges and cultivating the truly balanced dialogue between China and the rest of the world, including EU, is and will continue to be an essential element of the XXI century word puzzle. In order to enable that mission, I have also been working extensively with the topic of international law understood more broadly.

International Collaborations: My professional journey has been marked by a number of diversified international collaborations. They include:
(1) a nearly decade spent in China with (a) the China-EU School of Law — one of the top law schools in China involving prestigious partner universities from both China and EU, where I was teaching, researching, organizing research stays of visiting fellows, seminars, conferences and more; (b) one of the largest Chinese international law firms, and (c) the Embassy of Poland in Beijing;
(2) Oxford University's China, Law, and Development Project where I have been acting as a research associate since 2020;
(3) my current Maria Zambrano fellowship at the University of Barcelona, where I am a member of the DIDUE Research Group on International and EU Law;
(4) I am also an active member of numerous international law associations, incl. American Society of International Law, Asian Law and Society Association, and European China Law Studies Association. I have widely presented my work at international conferences (incl. in PRC China, Hong Kong, Taiwan, UK, Japan, Australia, Malaysia, Germany, Finland, Poland, Spain) and collaborated with scholars and practitioners from around the world. I am also an editor of the China-EU Law Journal and a reviewer for other journals, incl. the Asia Pacific Law Review.

Research and Publications: I have authored and co-authored book chapters and academic articles, with, among others, Oxford University Press, Edward Elgar Publishing and Cambridge University Press. I was also invited to prepare law-related publications for the institutions such as the European Commission, the Embassy of Poland in Beijing and the American Society of International Law. I have directed my work to both academic and professional circles. My work has been cited by scholars and practitioners from Europe, China, US and beyond. A significant part of my work is freely accessible. My freely accessible LinkedIn profile, where I regularly share my expertise, currently has 2995 followers.

Industry Collaboration: My work extends well beyond academia. Apart from my experience as a law practitioner, I have been invited to share my work by a number of institutions, incl. the European Commission, Embassy of Poland in Beijing and leading arbitration centres in the world.

I am fluent in Polish, English, Chinese, German, and Spanish. I posses qualifications: AQU Lector and attorney-at

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:**      **Derecho**
**Nombre:**            GKOUVAS , TRIANTAFYLLOS
**Referencia:**         RYC2023-043621-I
**Correo Electrónico:**  tgkouvas@der-pu.uc3m.es
**Título:**            Los desacuerdos teóricos en el Derecho: tipos, motivos y condiciones
**Resumen de la Memoria:**

El ámbito de mi investigación doctoral y posdoctoral ha abarcado diversos dominios de la investigación filosófica y doctrinal entre los que destacan la filosofía del derecho, la normatividad práctica, el derecho público y la metodología jurídica. Mi enfoque característico de la investigación ha sido la exploración de la naturaleza y el alcance de los desacuerdos fundacionales en derecho conectando y unificando varios dominios de investigación bajo el epígrafe general de "metajurisprudencia", a saber, (1) la semántica del discurso jurídico, (2) los fundamentos de la verdad jurídica y (3) la fuerza normativa de las normas jurídicas.

Llevar a cabo mi investigación doctoral en la Universidad de Amberes me ha brindado una oportunidad única de mantenerme al día de los avances en el campo de la filosofía práctica, así como en los dominios "extraños" de la metaética, la filosofía del lenguaje, de la mente y de la acción principalmente porque tuve el privilegio de beneficiarme de una estrecha colaboración entre dos centros de excelencia situados en la Universidad de Amberes, el "Centre for Law and Cosmopolitan Values" (en adelante CLCV), dirigido por mi supervisor principal, el profesor George Pavlakos, y el "Centre for Philosophical Psychology", dirigido por mi co-supervisor, el profesor Bence Nanay.

Mi nombramiento posdoctoral (2016-7) en la Universidad de Monash permitió mi interacción con un equipo de investigación internacionalmente distinguido de filósofos jurídicos australianos de la Universidad de Melbourne (Jeff Goldsworthy, Patrick Emerton), la Universidad Charles Sturt (Tom Campbell) y la Universidad de Monash (Dale Smith). Mi investigación formaba parte de un proyecto de investigación financiado por el Consejo Australiano de Investigación sobre la interacción entre los parámetros normativos, semánticos y metafísicos en la interpretación de los textos legislativos.
Durante todo el mes de mayo de 2017 fui invitado como profesor visitante por el "Uppsala Forum on Democracy, Peace and Justice" para participar en las actividades de investigación y docencia del Departamento de Filosofía de la Universidad de Uppsala y de la Facultad de Derecho de la misma Universidad.

Durante mi desempeño (2019-20) como profesor asociado de teoría jurídica en la Universidad de Glasgow y en virtud de mi condición de miembro de "Law and Philosophy Network" de la Universidad, participé activamente en el lanzamiento del "Glasgow Law and Philosophy Network" y en el diseño y la promoción de una nueva titulación en Política, Filosofía y Derecho (PPL).

Mi último nombramiento (2021-2024) como investigador postdoctoral en la Universidad Carlos III de Madrid ha sido una oportunidad única para diversificar mis actividades de investigación y docencia de forma que se entrecrucen con la cultura del mundo académico iberoamericano.

La línea de investigación propuesta considera la posibilidad de tratar el problema del contenido y operaciones de la "mente legislativa" como una manifestación localizada del problema más general de otras mentes. La investigación desarrollará la hipótesis de que la jurisdicción jurídica es normativamente imposible sin la asignación de tareas cognitivas a posiciones normativas distintas. Examinar la naturaleza del pensamiento jurídico a través de la lente de los recientes avances filosóficos sobre el problema general de las otras mentes.

**Resumen del Currículum Vitae:**

Desde la obtención de mi doctorado en 2015, he trabajado de manera constante y con aproximaciones interdisciplinares en las áreas de la filosofía jurídica, la metaética, la filosofía del derecho público, los derechos humanos y el derecho constitucional comparado.

El objeto de mi primera monografía titulada 'Law's Humility: Enlarging the Scope of Jurisprudential Disagreement' (Hart Publishing, 2021) es la articulación filosófica de una variante esencial pero poco desarrollada del desacuerdo jurisprudencial sobre qué categorías de hechos no jurídicos determinan el contenido y la fuerza normativa de las proposiciones jurídicas. Mi segunda monografía, titulada "The Place of Coercion in Law", fue publicada por la serie Elementos de Cambridge de Filosofía del Derecho en marzo de 2023. El objeto de esta monografía es la construcción de un modelo para la representación de los desacuerdos teóricos sobre la necesidad jurídica de la coerción estatal.

He publicado artículos en algunas de las revistas de teoría jurídica más prestigiosas (Jurisprudence, Archiv für Rechts und Sozialphilosophie, Analisi e Diritto, EUNOMÍA), así como una serie de entradas y capítulos en destacadas enciclopedias filosóficas (Springer), manuales (Routledge) y colecciones editadas (Hart Publishing, Elgar Publishing, Routledge). Un tema común que subyace a todas mis publicaciones se refiere a la articulación de las condiciones que hacen inteligibles los desacuerdos jurisprudenciales entre teóricos con lealtades metafísicas irreconciliables.

Desde 2021, soy coeditor de la sección "Schools of Legal Thought" para la Encyclopedia of the Philosophy of Law and Social Philosophy (Springer).

Durante mi desempeño (2019-20) como profesor asociado de teoría jurídica en la Universidad de Glasgow y en virtud de mi condición de miembro de "Law and Philosophy Network" de la Universidad, participé activamente en el lanzamiento del "Glasgow Law and Philosophy Network" y en el diseño y la promoción de una nueva titulación en Política, Filosofía y Derecho (PPL).

Mi nombramiento posdoctoral (2016-7) en la Universidad de Monash, así como mi actual nombramiento posdoctoral (2021-presente) en la Universidad Carlos III de Madrid han permitido mi interacción con equipos de investigación internacionalmente distinguidos de filósofos del derecho. He aprovechado los conocimientos acumulados en estos ámbitos de investigación para mantener colaboraciones en red y coordinar actividades de redes de investigación en el contexto de sociedades académicas internacionales.

Durante mi estancia como investigador postdoctoral en la Universidad Carlos III de Madrid he colaborado activamente en las actividades de investigación del Grupo de investigación sobre el Derecho y la Justicia (GIDYJ). He seguido mi propia línea de investigación sobre el mínimo social como objeto de un derecho humano y como exigencia de justicia y he participado como ponente invitado y convocante de eventos en los proyectos del GIDYJ, Ecoprudencia , Cultura de la Legalidad y Lucha contra la Corrupción, Construcción de Derechos Emergentes: Debates para la Fundamentación de Nuevos Parámetros de Constitucionalidad, y Programa Interuniversitario en Cultura de la Legalidad. Así mismo he desarrollado una importante actividad docente y he dirigido y dirijo diferentes TFG' s sobre diferentes materias dentro de mis líneas de investigación.

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| **Área Temática:** | **Derecho** |
| **Nombre:** | QUINTIÁ PASTRANA, ANDREI |
| **Referencia:** | RYC2023-044773-I |
| **Correo Electrónico:** | z.andrei.quintia@gmail.com |
| **Título:** | Property in "just transition": building legal indicators to measure sustainable urban policies |

**Resumen de la Memoria:**

Science has pointed to reducing land consumption and promoting more efficient constructions to address the climate transition. The law has increasingly embraced this issue, especially in the European Union, which has set zero land consumption as an objective for 2050. However, integrating urban development within the environmental limits of our planet while guaranteeing social justice presents major legal and policy challenges. The responsibilities this new paradigm places on property owners widens the margins of the "social function of property" as traditionally understood. Significant tensions may arise between certain individual rights (property, market freedoms) and social policy objectives derived from constitutional and international rights, such as the protection of the environment or the right to housing. These tensions will test traditional standards of proportionality in both judicial review and policy design. Urban development in the 21st century requires a deeper understanding of the limits of private property based on rigorous methodology and empirical knowledge to accommodate new social and climate demands.

My research is ultimately concerned with providing a new understanding of urban property that incorporates the 21st-century social and climate needs (environmental crisis, housing shortages, social segregation etc). I plan to conduct a constitutional study on the right to private property as an institution evolving in a transformative setting. Acknowledging the legal challenges arising from this conceptualisation, I aim to establish a new methodology for the analysis of private property and the articulation of public policies (town and country planning, regulation with impact on land and housing, urban legislation, and sectorial approaches) or judicial review affecting property rights. I will address this through socio-legal and law-and-economics methodological approaches, as well as new empirical research methods based on data science techniques (i.e., machine learning, network analysis). In this respect, I will design a set of legal indicators for the assessment of measures with an effect on property rights. This new methodological approach to the study of private property is unique and represents a significant leap from my previous trajectory. However, the experience gained in my participation in the EVICT project in the University of Groningen will help me build a solid research strategy. We are already applying similar methodologies in innovative studies on the right to housing.

As a result of this research I aim to promote legislative changes and inform policy design and administrative and judicial pratice. I also plan to publish the results in high-impact indexed national and international journals. I also plan to edit a book in a scientific publisher and a textbook to facilitate the dissemination of this results in teaching different subjects (urban planning, geography, administrative law, constitutional law). I will also present my papers in different international networks. My regular contribution to the European Network of Housing Research, the Association of Law, Property and Society, the Socio-Legal Studies Association and the Law and Society Association would most likely contribute to strengthening my dissemination strategy.

**Resumen del Currículum Vitae:**

I graduated in Law (2016) and Masters in legal practice (2018) at the University of Santiago de Compostela. During the last semester of my Masters, I started my PhD studies (2017) under a competitive pre-doctoral contract funded by a Spanish Government programme (FPI). I defended my thesis on 21 December 2021, obtaining an extraordinary distinction (cum laude) and an international mention. My thesis is shortlisted for the Extraordinary PhD award of the University of Santiago de Compostela. Following this, I started a post-doctoral contract funded under the same funding programme. Immediately following this, I won a postdoctoral position in the University of Groningen where I currently participate as researcher in an ERC Starting Grant project (EVICT, Ref. 949316) to investigate the international right to housing under advanced empirical methodologies involving big data and neural networks.

While my main research has focused on housing, I have also expanded my research interests to the environmental limits of urban development and the relationship between law and technology. On those topics, I have published 5 articles in open access indexed journals (Scopus, WoS, Dialnet), including an international leading journal in the field (Housing Studies). I have also published a monography, 8 book chapters and coordinated a book. Likewise, during this time, I have participated in 9 research projects, one of them lead by me.

From the outset of my career, I have successfully internationalised my research. I regularly participate in the European Network of Housing Research and other international forums of housing and property experts (ALSP, LSA, SLSA, etc.). I have organised two international housing conferences in Santiago (2019) and Amsterdam (2024), coordinating leading researchers and stakeholders from the UK, Ireland, the Netherlands, Sweden, Norway and Spain. I have completed research stays at the universities of Oxford (08/01 to 15/02, 2019), Coimbra (19/10 to 30/11, 2020) and Stockholm (18/08 to 21/09, 2021), funded by the Spanish Government, and Wakayama (09/06 to 29/06, 2022) funded by the Erasmus+ programme on competitive call. Through these experiences I have built a strong global network of leading experts with which I regularly engage in conferences, projects, and publications.

My early involvement in a novel line of research and the use of innovative methodologies has made me a referent on the right to housing and the Spanish housing policies. This is proven by the fact that I have been called to review in journals, projects and for an interim report on a doctoral thesis. This is also evidenced by my contributions to dissemination magazines, my work with civil society organisations, and my participation in contracts for consultancy services with municipal governments. I was also invited to lecture in courses and forums addressing different stakeholders on different issues regarding the right to housing.

Finally, I have contributed to the mentoring of other researchers since the beginning of my pre-doctoral stage through different means. As a postdoc researcher at the University of Groningen I am co-supervising a doctoral thesis; mentoring other pre-doctoral students; and I have assisted dozens of masters students in the development of their thesis.

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| **Área Temática:** | **Economía** |
| **Nombre:** | LEKFUANGFU , NUARPEAR WARN |
| **Referencia:** | RYC2023-043730-I |
| **Correo Electrónico:** | nlekfuan@eco.uc3m.es |
| **Título:** | Aspiration, Inequality and Fairness Preferences |

**Resumen de la Memoria:**

My primary research fields are labour economics, development economics, and behavioural economics. I have a strong interest in issues surrounding patterns and causes of inequalities, in particular childhood environments, subjective beliefs, and social norms. I integrate different methodological approaches and empirical techniques, including micro-econometrics, lab experiments and randomised controlled trials, to better understand and address inequality of opportunity in different social contexts.

I can summarise my research in third broad agendas, which are bound together by the overarching goal, which is to seek empirical-based solutions to alleviate social and economic inequality.

Agenda 1 examines on the linkages between family-related factors, subjective beliefs, and human capital development

Agenda 2 focusses on the relationship between institutions, norms, and social outcomes.

Agenda 3 investigates the implications of trade and technology on labour markets

In the next few years, I plan to deepen and extend my research along the agendas I have outlined above. Along with different groups of collaborators, my on-going and current research follows 4 research lines, all of which are tied together by my core interest in causes and consequences of inequality in various dimensions.

1. Using RCT to understand the relationship between human capital decisions, subjective beliefs and aspirations in developing countries

2. Formation of children aspirations: looking at the roles of innovation and trade in shaping youth's aspirations in college choices and labour market decisions, in the context of the US and globally.

3. Gender roles and labour market outcomes: investigating the role of paternity leave reform on gender disparity, and estimating child penalty with evidence from miscarriage and abortion

4. Understanding preferences for redistribution and its implication of inheritance decisions

With respect to expected impact, I intend that the research plan will result in, first of all, 6-7 working papers. And I expect that some of them will eventually be published in top general interest journals, and others in top field journals in development, public or labour economics. Given the topical issues addressed in each research line, I expect that these papers will achieve a wide outreach, a good number of citations, along with their high potential to inform public policies.

**Resumen del Currículum Vitae:**

I am an Associate Professor (equivalent to Profesora Titular) of Economics at Universidad Carlos III de Madrid (UC3M).

I received my PhD in Economics at University College London in 2015, and an MSc at the London School of Economics. I hold a BA in Politics and Economics from the University of York.

My research fields are Development Economics, Labour Economics, Behavioural and Applied Microeconomics, with a strong interest in issues surrounding patterns and causes of inequalities, in particular early childhood environments. My research integrates different methodological approaches and empirical techniques, including micro-econometrics, lab experiments and field interventions (randomised controlled trials), to better understand and address inequality of opportunity in different social contexts. My works are well-cited within Economics and among multidisciplinary fields.

I have a successful history as a Principal Investigator in numerous grants since my PhD. In brief, during 2020-2023, I was the principal investigator of SOCINEQUAL, which was a research project on understanding the roles of subjective beliefs, future aspirations, and group identity on social inequality. This is funded Spanish Ministry of Science and Innovation (under Proyectos de I+D+i Retos Investigación - Individual).

From 2023-2027, I am a co-investigator of a UKRI/ ERC Starting Grant funded project, MISMATCH (with Suphanit Piyapromdee as the Principal Investigator).

I am also a Research Fellow at the IZA, the Centre for Research and Analysis of Migration (CReAM) (UCL), and the Center for Behavioral and Experimental Economics (CBEE) (Chulalongkorn University, Bangkok). In addition, I currently serve as an Executive Board Member (Treasurer) for the Asian and Australasian Society of Labour Economics (AASLE).

For professional services, I regular act as a referee for various, high-level academic journals, as well as stand as a Scientific Program committee for numerous international Economic conferences. I am in an organising committee of the 2024 Annual meeting of the Asian and Australasian Society of Labour Economics in Bangkok, Thailand. I also work closer with Thailand's Ministry of Labour where I advise policies and provide technical training for their staffs.

At present, I am supervising 2 PhD students at UC3M, along with more Master students. I have been on various external as well as internal committees for PhD defence, within and outside Europe.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Economía** |
| **Nombre:** | GALLI , CARLO |
| **Referencia:** | RYC2023-044688-I |
| **Correo Electrónico:** | carlogalli87@gmail.com |
| **Título:** | Macroeconomics, International Finance and Information Economics |

**Resumen de la Memoria:**

My main scientific contributions are publications, reports, presentations in high-profile international conferences, grants, and awards.

All of my published work is accessible in ungated version from my webpage, and is accompanied by open-source code published in the journals' online appendices, and as a repository in my Github page (https://github.com/carlogalli).

Publications
1) "Is Inflation Default? The Role of Information in Debt Crises", Marco Bassetto and Carlo Galli, American Economic Review, October 2019, vol. 109, no. 10, pp. 3556-84.
2) "Self-Fulfilling Debt Crises, Fiscal Policy and Investment", Carlo Galli, Journal of International Economics, July 2021, vol. 131, p. 103475.

Collaboration with final users
3) "Debt for Health Report", Carlo Galli and Stéphane Guibaud, June 2021.

Dissemination activity
4) I presented my work in some of the most important conferences in the Economics profession, as well as in prestigious departments across Europe.

Recognition of research trajectory
5) Juan de la Cierva-Formación Fellowship, 2021-2023; project title "Sovereign Debt and Fiscal-Monetary Policy"; amount 52.000 EUR.
6) Ayudas a la Investigación en Ciencias Sociales, Fundación Ramón Areces, 2023-2026; project title "Fiscal-Monetary Interactions with Default Risk and Large Central Bank Balance Sheets"; amount: 36.000 EUR. I am the Principal (and unique) Investigator in the project.
7) Grant PID2021-122931NB-I00, Agencia Estatal de Investigación, 2022-2025; project "Understanding and addressing contemporary policy challenges"; amount: 46.560 EUR. The Research Team consists of Principal Investigator Paraskevi Pappa (UC3M) and myself.

Service to the Profession
8) Referee work for top journals such as Econometrica, the Review of Economic Studies, the AEJ: Macroeconomics, the JEEA, Quantitative Economics, and the Journal of International Economics, among others.
Proposal evaluator for ERC Consolidator.
Member of the Program Committee for International Economics of the EEA Annual Congress since 2022.

Internationalization and Mobility
PhD at UCL in London, numerous research visits at the Minneapolis and Chicago Fed, postdoctoral period at Sciences Po in Paris, appointment to the CEPR network, several presentations at invited seminars and conferences abroad.

Line of Research
My research develops along three main directions.

First, my current and future work on sovereign bond purchases analyses their effects on asset prices, the information contained therein, and on aggregate variables such as inflation and welfare. I also study the dynamic effects of these purchases on the likelihood of debt crises, the cost of debt service, and the incentives to overborrow for impatient countries

Second, my work on fiscal-monetary interactions studies the strategic trade-off of defaulting explicitly via default, or implicitly via inflation. I consider the effect of monetary policy on government debt sustainability and default risk, when central banks are large creditors of the government, and their independence is possibly under scrutiny.

Third, I study the default and restructuring process per se, and in particular on the theory and empirics behind the use of "Collective Action Clauses" (CACs).

**Resumen del Currículum Vitae:**

Academic positions:
2021 — now: Universidad Carlos III de Madrid, Assistant Professor of Economics.
2020 — 2021: Sciences Po Paris, Chair in Sovereign Debt, Postdoctoral Researcher.

Education: PhD in Economics, University College London, 2014-2020. Advisors: Marco Bassetto (primary) and Wei Cui. Thesis: "Essays on Macroeconomics and Sovereign Default".
Research fields: Macroeconomics, International Finance, Information Economics.

Publications:
"Is Inflation Default? The Role of Information in Debt Crises" (with Marco Bassetto),
American Economic Review, October 2019, vol. 109, no. 10, pp. 3556-84.
"Self-Fulfilling Debt Crises, Fiscal Policy and Investment",
Journal of International Economics, July 2021, vol. 131, p. 103475.

Working papers:
"Inflation, Default Risk and Nominal Debt", April 2020.
"Asset Purchases and Default-Inflation Risks with Noisy Financial Markets" (with Gaetano Gaballo), April 2022.
"Dealing with Heterogeneous Creditors in Sovereign Bond Restructurings" (with Stéphane Guibaud), May 2022.
Policy papers: "Debt for Health Report", (with Stéphane Guibaud), June 2021.

Teaching Experience:
Main instructor at UC3M: Macroeconomics II (PhD, 2021-now); International Trade (BSc, 2022-23)
Teaching assistant at UCL: Macroeconomics (MSc, 2015-2020); Topics in Money and Finance (MSc, 2019-2020); Macroeconomics (1st year PhD, 2016-2017).

Previous employment:
2012-2014: Analyst Trader, Inflation Trading Desk, Goldman Sachs International, London.
2011: Summer Intern, Securities Division, Goldman Sachs International, London.

Selected Invited Seminars, Workshops, Conferences:
2024: Sciences Po/Banque de France Research Seminar.
2023: Bicocca di Milano; Oxford; "Rethinking sovereign debt sustainability and crises" Mini Conference, EUI; 30th CEPR ESSIM, Tarragona (discussant); International Finance and Macro, BSE Summer Forum; Expectations in Dynamic Macro Models, BSE Summer Forum; SED Cartagena; Spanish Economic Association Symposium, Salamanca.
2022: EIEF; SciencesPo Summer Macro Workshop; Toulouse School of Economics; Alicante; Tinbergen Institute; DebtCon 5, Florence; International Macroeconomics Workshop, Leuven Summer Event; 16th CSEF-IGIER Symposium on Economics and Institutions, Capri; 5th Workshop of the Spanish Macroeconomics Networks, Barcelona; Spanish Economic Association Symposium, Valencia.
2021: CEMFI; Information Asymmetries in Financial Markets, BSE Summer Forum (discussant); SED Minneapolis.
2020: Banco de España; EIEF; Carlos III de Madrid; Sciences Po; Banque de France; Bologna; Cambridge; Stony Brook.
2019: ECB PhD Candidates Workshop; Econometric Society European Winter Meeting, Rotterdam.
2017: Chicago Fed; NBER Summer Institute MEFM; Econometric Society Summer Meeting, Lisbon.

Scholarship, Grants and Awards
2023: Fundación Ramón Areces, Ayudas a la Investigación en Ciencias Sociales, research grant, 36k EUR.
2021-2023: PID2021-122931NB-I00, Ministerio de Ciencia e Innovación (with PI Evi Pappa), research grant, 45k EUR.
2021-2023: Juan de la Cierva-Formación, Ministerio de Ciencia e Innovación, fellowship, 52k EUR.

Refereeing Activity
Journals: Econometrica; AEJ: Macroeconomics; JEEA; Quantitative Economics; Journal of International Economics.
Grants: ERC Consolidator Grant; Fondecyt National Projects Competition (Chile).

Public and Departmental Service
2022-now: Program Committee (International Economics), EEA Annual Congress.
2021-now: Co-organiser, UC3M.

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| **Área Temática:** | **Economía** |
| **Nombre:** | JEENAS , PRIIT |
| **Referencia:** | RYC2023-044260-I |
| **Correo Electrónico:** | priit.jeenas@upf.edu |
| **Título:** | Firms, Financial Frictions, and Money in the Macroeconomy |

**Resumen de la Memoria:**

My research interests lie at the intersection of macroeconomics, monetary economics and financial economics. The general common theme of my research agenda is the goal of understanding how financial frictions, monetary issues, and the heterogeneity of firms and households matter for real outcomes in the macroeconomy, with the ultimate objective of informing macroeconomic policy decisions. My approach to economic research employs structural modeling of general equilibrium economies and empirical analysis of individual-level data. Disciplining structural macroeconomic research with micro-level data allows to provide new insights, improve the performance of models, and enhance their ability to advise policy.

In this regard, my existing and ongoing work spans a variety of topics, including:
(i) the role of stock prices in monetary transmission to firms' investment;
(ii) the relevance of firms' balance sheet liquidity for monetary transmission;
(iii) the effects of public procurement contract allocation on firm dynamics and long-run macroeconomic outcomes;
(iv) the effects of worker-level labor income risk on the relevance of firms' financial frictions for business cycle fluctuations.

These papers are either solo-authored or coauthored with relatively small research teams and thus contain a significant contribution from my side. One of the papers has been accepted for publication at the Journal of Political Economy (forthcoming, March 2024) and two others are at the stage of having been submitted for peer review in other top international journals of general interest in Economics (the American Economic Review, to be specific). My papers have accumulated a considerable amount of citations, showing a consistent upward trend in yearly citations. The results of these projects have been disseminated by me and my coauthors at invited seminars and leading international conferences at top universities, research centers, and central banks around the world.

In future lines of research, to be developed during the grant, I will continue my work on related topics, as well as explore new areas. As examples of four promising projects in my pipeline, at different early stages of completion, I am exploring (i) the role that capital price fluctuations play in misallocating capital after financial crises and monetary policy actions, (ii) the importance of firms' marginal propensities to invest in governing the macroeconomic effects of government spending, (iii) the effects that winning public procurement contracts has on the uncertainty faced by individual firms, and (iv) the effects that public procurement contract allocation across firms has on economy-wide fiscal multipliers.

**Resumen del Currículum Vitae:**

I am an Assistant Professor at Universitat Pompeu Fabra (UPF), a Research Associate at Centre de Recerca en Economia Internacional (CREi), and an Affiliated Professor at Barcelona School of Economics (BSE). I received my Ph.D. in Economics from New York University in 2019. Prior to my doctoral studies, I obtained Master of Research and Master of Science degrees in Economics from UPF and Barcelona GSE. I also hold a Bachelor of Arts in Economics and Business Administration from the University of Tartu.

I am a macroeconomist with interests in monetary and financial economics. More specifically, the main objective of my research is to understand how financial imperfections and monetary issues affect the behavior of heterogeneous economic agents, the macroeconomy, and the effectiveness of macroeconomic policy. In this respect, I have produced a series of papers, both answering long-standing questions in Macroeconomics using novel approaches, and exploring issues that have remained understudied so far.

My work has generated notable impact, as illustrated by a consistent increase in yearly citations (263 Google Scholar citations in total, as of 26/01/24) and invitations to present at seminars and conferences at renowned research institutions and universities. More specifically, the paper "Q-Monetary Transmission" has been accepted for publication in the Journal of Political Economy, about to be published in the March 2024 number. My working paper on "Firm Balance Sheet Liquidity, Monetary Policy Shocks, and Investment Dynamics" is at the forefront of a rapidly re-emerging literature on the effects of monetary policy shocks to firms (with 175 GS citations). And the paper "Buy Big or Buy Small? Procurement Policies, Firms' Financing, and the Macroeconomy" is gathering heightened interest by policymakers, for example being invited to be presented at a high-profile research conference on the Spanish Economy at Banco de España by my co-author. The latter two papers have recently been submitted for peer review at the American Economic Review.

I have been individually awarded the Juan de la Cierva Formación Research Fellowship (for 50,000€) and the Barcelona School of Economics Seed Grant (for 7,700€) to conduct work on various research projects. As an investigator, I am participating in research teams that have received the European Investment Bank - Universities Research Sponsorship (for 300,000€) and an I+D grant from the Spanish Ministry of Science and Innovation (for 81,191€).

I regularly present my work at renowned universities, central banks, and leading international conferences, such as the NBER Summer Institute, the SED Annual Meeting, and the CEBRA Annual Meeting. I actively serve as a referee for top Economics journals, such as the American Economic Review, Econometrica, the Journal of Political Economy, and the Review of Economic Studies, etc. I also participate in organizing workshops for the Barcelona School of Economics Summer Forum, and research seminars at CREi-UPF. I am currently the co-advisor of one Ph.D. student at UPF (Antonio Villani), I

am a reference letter writer of another Ph.D. student currently on the Job Market (Andrea Sy), and I actively participate in the general guidance of many more Ph.D. students at UPF. I teach undergraduate and Ph.D. level courses at UPF and BSE.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Economía** |
| **Nombre:** | HUPKAU , CLAUDIA |
| **Referencia:** | RYC2023-044087-I |
| **Correo Electrónico:** | claudia.hupkau@cunef.edu |
| **Título:** | Public policies, gender equality and child development |

**Resumen de la Memoria:**

I am a labor economist specializing in gender and education economics. I obtained my Ph.D. in 2017 from Universite Catholique de Louvain (UCL), Belgium. I take pride in my nine publications, which include one forthcoming, all featured in reputable indexed journals. These works have garnered substantial recognition, accumulating 182 citations on Web of Science and an impressive 734 on Google Scholar.

A highlight in my research career is the paper, "Work, Care and Gender during the COVID‐19 Crisis," published in 2020. Co-authored with Barbara Petrongolo, this piece delves into the unequal impact of the pandemic on men and women in both the labor market and domestic sphere. The paper has received 430 citations on Google Scholar and has been featured in prominent news outlets such as The Telegraph, The Independent, The Economist, and BBC Worklife. It secured a "Most Influential Paper Award" and has high Altmetric scores, positioning it in the top 5% of all research outputs tracked by Altmertric.

My recent research has extended to exploring gender inequality in Spain, as evidenced by the publication "Work and Children in Spain: Challenges and Opportunities for Equality Between Men and Women" (2022). We examine the evolution of gender disparities over time, revealing patterns related to employment, unemployment, and part-time work, particularly in the context of child-rearing. The article, featured in CentrePiece Magazine and various blogs, conferences and webinars, has been cited 15 times on Google Scholar and prompted an invitation to contribute a chapter to the book "Un país Posible" (2023, Deusto), allowing for an updated analysis of our original findings.

My collaboration with Jenifer Ruiz-Valenzuela and Esteban Aucejo resulted in the paper "Where versus What: Value-Added and Returns to Fields of Study in Further Education" (2023). This research, born out of my involvement in setting up the Centre for Vocational Education Research (CVER) at the LSE, presents valuable insights into the value-added by vocational education institutions and the returns associated with different fields of study.

My career has also been marked by a rich international trajectory. I pursued my master's and doctoral studies at the Université Catholique de Louvain in Belgium, with a visit to Columbia University in New York during my Ph.D. studies. I later served as a Visiting Fellow at the Institute for Labor Economics (IZA) in Bonn in 2019, further expanding my international network of collaborators.

My leadership roles include serving as Co-PI in three research grants, showcasing my commitment to advancing impactful research. As a testament to my dedication to nurturing future talent, I have supervised over 25 undergraduate theses at CUNEF. Although CUNEF Universidad does not currently have a Ph.D. program, my involvement in the "Proyecto Generación de Conocimiento 2022" grant allowed for the selection of a doctoral candidate focusing on topics related to how public policies affect gender inequality in the labor market and at home.

I also co-managed a full-time Research Assistant at CUNEF, contributing significantly to ongoing studies. Despite the challenges posed by career breaks and the pandemic, I remain committed to fostering research national and international collaborations and maintaining an active network of co-authors through virtual means.

**Resumen del Currículum Vitae:**

I am a labor economist with a focus on gender and education economics. I obtained my PhD in Economics from the Université Catholique de Louvain, Belgium, in August 2017. Currently, I am Associate Professor of economics at CUNEF Universidad, Madrid. Prior to joining CUNEF Universidad, I was a research economist at the Centre for Economic Performance (CEP) at the London School of Economics (LSE) from 2014 to 2017. During my time at the CEP, I was also the research coordinator at the Centre for Vocational Education Research (CVER). In this role, I was responsible for conducting research on the economics of vocational education using English administrative data and for coordinating the research activities of the four institutions that comprised the research centre.

Together with Lidia Farré (CSIC), I am Co-Principal Investigator of the project "Politicas, Familias y Mercado de Trabajo" (Funding body: Ministerio de Ciencia, Reference: PID2022-140206OB-I00), which has been granted 139,000€ in funding last year. I am also Co-PI (with Jenifer Ruiz-Valenzuela of Universitat de Barcelona) of the project "When paternity leave catches up: Impact on gender equality and labour market outcomes" (Funding body: Ramon Areces, amount: 36,000€). I have been Co-Principal Investigator of a collaborative research grant from IZA (Bonn, Germany) with value 125,000€ obtained in a competitive call in 2020. This project led to the publication of a paper published in Labour Economics, contributions to podcasts, several blog posts and general audience articles (for instance in LSE Business Review, CentrePiece).

I have eight scientific publications in international journals indexed in the Journal Citation Report: Journal of Human Resources (IF: 6,531), 2 x Labour Economics (IF5Y: 2.464), Economic Policy (IF5Y: 6.654) Fiscal Studies (IF5Y: 3.741), SERIEs (IF5Y: 1.624), Journal of Economic Behavior and Organization, and National Institute Economic Review. As of January 2024, my work has received 733 citations in Google Scholar. I also have a paper accepted for publication (as of Jan 24th, 2024) at the Journal of Public Economics (IF5Y: 8.262). In addition, I have a revise and resubmit at the Journal of Human Resources. My paper published in Fiscal Studies (joint with Barbara Petrongolo) has won a "Most Influential Paper Award" by the journal and has been cited more than 430 times according to Google Scholar.

Finally, given that my work has relevant policy implications, I have made important efforts to communicate the results of my research to the public and to make connections with policy makers.My research has been featured in national and international newspapers and radios (for example, El Pais, La Vanguardia, The Telegraph, The Independent, The Economist, BBC Worklife). I have presented my research at international organizations and government ministries. I was invited to give presentations to education experts at the World Bank and the Inter American Development Bank. I was invited as economic expert by the Basque Parliamentary Group in the Spanish Senate (Grupo Parlamentario Vasco en el Senado). I have contributed a

chapter to the publication " Accelerate Learning" , edited by the Inter American Development Bank. I have written blog post on my research in the LSE Business Review, VoXEU, LSE British Politics and Policy, CentrePiece and Nadaesgratis.es.

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| **Área Temática:** | **Economía** |
| **Nombre:** | TROYA MARTINEZ, MARTA |
| **Referencia:** | RYC2023-045181-I |
| **Correo Electrónico:** | marta.troyamartinez@gmail.com |
| **Título:** | Investigacion sobre relaciones informales y economia de la informacion |

**Resumen de la Memoria:**

My research spans relational contracts, industrial organization, law and economics, organizational economics and the political economy, focusing on informal economic mechanisms and their impacts on market dynamics and contract enforcement. My work combines theoretical models and empirical analyses to explore policy relevant questions.

My current research primarily focuses on relational contracts, which are self-enforcing informal agreements not upheld by courts but maintained due to the long-term benefits of the relationship surpassing short-term advantages of breach. I have particular interest in contexts where there are some situations of illegality such as mafia influence on labor unions, default of trade credit, expropriations by foreign governments and the payment of bribes. These contributions, highlighted through publications in prominent journals (such the Journal of European Economic Association and the International Journal of Industrial Organization) and policy briefs, underscore the complexity of informal agreements and their significant implications for economic and organizational theories.

In the past, I also worked in information economics and industrial organization. My research spans modeling the effects of vagueness in information-sharing, examining the consequences of misleading advice and its legal ramifications, and exploring communication strategies in settings with multiple audiences. These studies contribute to understanding the dynamics of information exchange, persuasion tactics, and their impact on economic decisions, offering a nuanced view of communication's role in markets and legal contexts. I have published this work at Games and Economic Behavior and Journal of Economics & Management Strategy.

The research path planned encompasses exploring informal economic activities through relational contracts, analyzing their implications across various sectors, including illegal activities like bribery and labor rackets. Projects include examining the strategies major oil companies use to mitigate expropriation risks, the impact of CIA activities on oil contract enforcement, and the Mafia's influence on labor unions in America, highlighting how such informal agreements affect market dynamics and contract enforcement. Additionally, my work in progress explores the effects of contract standardization in Russia's public procurement and investigates the economic consequences of under-the-table payments to evade taxes. This comprehensive research agenda aims to deepen understanding of informal economic mechanisms and their broader economic implications.

Overall, my international engagement, including presenting at top venues and leading workshops and mentorship, underscores my commitment to economic research and education. My achievements are recognized through fellowships, collaborative projects, and contributions to international research networks, highlighting my role in advancing the field of economics.

**Resumen del Currículum Vitae:**

Employment:
2022-now: Associate Professor (without tenure), NES
2014-2022: Assistant Professor, NES
2012-2014: ESRC Postdoc, University of Oxford
Appointments:
Oct 17-now: Research affiliate, CEPR
Sept 16-Jul 17: Visiting professor, TSE
June-Nov 2015: Academic visitor, UAB
Sept-Jan 2011: Academic visitor, CEMFI
April 2010: Academic visitor, Bank of Spain
Education:
2008-2012: DPhil in Economics, University of Oxford 2006-2008: MPhil in Economics, University of Oxford
2003-2005: Master in Economics, TSE
1999-2003: BA in Business Administration, UPF
Publications:
"Managing Relational Contracts", with Liam Wren-Lewis, Journal of the European Economic Association, Vol. 22, Issue 3 (2023), pp. 941-986.
"Vague lies and lax standards of proof: On the law and economics of advice", with Mikhail Drugov , Journal of Economics & Management Strategy, Vol. 28 (2019), pp. 298-315.
"Self-Enforcing Trade Credit" International Journal of Industrial Organization, Vol. 52 (2017), pp. 333-357.
"Vagueness and Information-Sharing" Games and Economic Behavior, Vol. 100 (2016), pp. 301-320.
Work in progress:
"I'll pay you later: Sustaining Opportunistic Relationships", with Elena Paltseva and Gerhard Toews
"Once Upon a Time in America: the Mafia and the Unions", with Giovanni Mastrobuoni and Andrea Matranga
"Public Procurement Relationships in the Shadow of Trial: Evidence from Russia," with Dzhamilya Nigmatulina and Gerhard Toews
"CIA infiltration and the enforcement of oil contracts", with Elena Paltseva and Gerhard Toews
"Cheap Talk with Two Audiences: An Experiment", with Mikhail Drugov, Roberto Hernán González and Praveen Kujal

Teaching:

2019-present: Contracts, Information and Incentives in Organizations, BA, NES

2015-2023: Organizational Economics, Graduate, NES (except 2017)

2014-present: Microeconomics 4, Graduate, NES (except 2017)

Other service:

2023-2026: Board of Directors, SIOE

2022, 2024: Scientific committee, JIE

2019-2021: Program committee, SIOE

2018-now: Female mentoring program, NES

2017-2022: Member of the Ethics Committee, NES 2017-2022: Seminar organizer, NES

2014-now: Thesis supervisor of a number of undergraduate and graduate students, NES 2015-present: Co-organiser of the Workshop on Relational Contracts

2013-2014: Co-organiser of the Postdoc and DPhil Workshop, University of Oxford

Awards:

2019: CASBS Stanford Fellowship for Organizations and their Effectiveness Summer Institute 2015-2017: Russian Science Foundation, 21 Million RUB, No. 15-18-30081 (PI: Sergei Izmalkov)

2012-2014: ESRC Grant, £156,180.40, PTA-026-27-3009 (PI: Marta Troya Martinez)

2010-2012: Fundación Ramón Areces Fellowship

2009-2010: Bank of Spain Fellowship

2008-2009: Doctoral Studentship Scheme awarded by the University of Oxford 2006-2008: Fundación Caja Madrid Fellowship

2004-2005: La Caixa Fellowship, joint with the French Government 2002-2003: Spanish Ministry of Education research Fellowship

Refereeing:

AEJ:Micro, AER, Economic Journal, GEB, JEEA, JLEO, JPE, IJIO, Management Science, QJE and RAND Journal of Economics among others

Conferences & seminars:

Seminars at UAB, Erasmus University, Nottingham Business School, City University of London, University of Naples, Texas A&M University, University of Copenhagen, Lund University, CUNEF, CEMFI, University of Oxford and meetings at the NBER, CEPR and ASSA among others

Two children: 2011, 2015

# AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:**      **Economía**
**Nombre:**      WELLSCHMIED , FELIX
**Referencia:**      RYC2023-043181-I
**Correo Electrónico:**      fwellsch@eco.uc3m.es
**Título:**      Macroeconomía

## Resumen de la Memoria:

I am a macroeconomist with research interests in labor economics, social insurance, and firm decisions. My first line of research is motivated by the fact that earnings and wealth differ greatly across individuals. In the U.S., the Gini coefficient of earnings is 0.4 among individuals aged 25-60, and the 75 to 25 ratio of the earnings distribution is 2.5. In two of my publications, I contribute to a better understanding of this inequality and the idiosyncratic risk that workers face in the labor market. In "Modeling Life-Cycle Earnings Risk with Positive and Negative Shocks", published in the Review of Economic Dynamics, I provide estimates of idiosyncratic labor market risk over individuals' life cycles. In "Quantifying the Contribution of Search to Wage Inequality", published in the American Economic Journal: Macroeconomics, I show that firm heterogeneity is relatively unimportant to understanding earnings inequality.

Given the large inequality in economic resources and missing private insurance markets, the government has a potential role to play in increasing social welfare by insuring workers against labor market risk and by redistributing resources across households. In "The Welfare Effects of Asset Means-Testing Income Support", published in Quantitative Economics, I show that the government should not use households' wealth to determine eligibility for such insurance programs.

My other line of research contributes to a better understanding of the risks firms and their owners face. In "Endogenous Hours and the Wealth of Entrepreneurs", published in the Review of Economic Dynamics, I show that an owner's own labor supply to her firm is an important determinant for cross-sectional wealth inequality among owners. In "Worker Churn in the Cross Section and Over Time: New Evidence from Germany", published in the Journal of Monetary Economics, I show that match quality uncertainty is an important factor driving labor and job reallocation.

My current research extends my existing liens of research by studying secular changes in labor market risk, non-governmental income insurance in emerging economies, the role of monopsony power for labor productivity, and firms' labor demand for temporary work contracts.

My research has been widely cited by the profession (178 Google Scholar citations), and I belong to the top 10% of most productive economists over the last 10 years according to the IDEAS/RePEc database. I am committed to an open diffusion of my research to other researchers and the public. To that end, I publish the latest working-paper versions of all my published work on my webpage, thus, providing free access to my work. Moreover, I provide detailed computer codes on my webpage for each project that allow others to assemble the data and replicate my model simulations.

## Resumen del Currículum Vitae:

I obtained my Ph.D. from the University of Bonn under the supervision of Prof. Monica Merz. After a one-year post-doc, in 2014, I joined the Universidad Carlos III de Madrid. I spent the year 2018 visiting the Instituto Technológico Autónomo de México following an invitation by Carlos Urrutia. Afterward, I returned to the Universidad Carlos III de Madrid, where I was granted tenure in 2022. Throughout, I have conducted research that contributes to a better understanding of inequality in economic resources across individuals and the consequences of governments redistributing these resources across individuals. Moreover, I study optimal firm decisions. The research has obtained funding through the Fundación Ramon y Areces (principal investigator) as well as two research groups sponsored by the Spanish Ministry of Economics (member of a research team).

My first line of research contributes to a better understanding of labor markets. The paper "Modeling Life-Cycle Earnings Risk with Positive and Negative Shocks", which is joint work with a Ph.D. student and published in the Review of Economic Dynamics, highlights that labor market risk is drastically changing over individuals' life cycles. In "Quantifying the Contribution of Search to Wage Inequality", published in the American Economic Journal: Macroeconomics, we show that firm heterogeneity is relatively unimportant to understanding cross-sectional wage inequality in the U.S. My past work on optimal governmental insurance, "The Adverse Effects of Asset Means-Testing Income Support", is published in Quantitative Economics.

My final line of research studies firm behavior under risk. The paper "Endogenous Hours and the Wealth of Entrepreneurs", published in the Review of Economic Dynamics, shows that owners working in their own firms are an important determinant for wealth inequality between firm owners. The paper "Worker Churn in the Cross Section and Over Time: New Evidence from Germany", published in the Journal of Monetary Economics, shows that match quality uncertainty is an important factor driving labor and job reallocation.

I have been part of a research team that has developed jointly with the public German Employment Agency to create a new administrative plant-level data set, the Administrative Wage and Labor Market Flow Panel, that now provides a unique rich firm-level dataset to all researchers.

During my time at Carlos III, I taught Macroeconomics in the Ph.D. program each year. Resulting from this, I have closely supervised eight Master theses and currently supervise two Ph.D. students.

My service to the research community includes being an Associate Editor for the European Economic Review. Moreover, I served as a referee for peer-reviewed journals such as the American Economic Journal: Macroeconomics, Econometrica, Economica, the International Economic Review, Quantitative Economics, and the Review of Economic Dynamics. In addition, I have served as an evaluator for the second round of an ERC starting grants in 2021.

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| **Área Temática:** | **Economía** |
| **Nombre:** | SCHNEIDER , JOHANNES |
| **Referencia:** | RYC2023-043836-I |
| **Correo Electrónico:** | jschneid@eco.uc3m.es |
| **Título:** | The Organization of Scientific Progress and Legal Disputes |

**Resumen de la Memoria:**

I am an organizational economic theorist that plans to advance our understanding of the behavior in markets lacking a price mechanism. Specifically, I focus on two distinct areas: (i) the Economics of Science and Innovation, and (ii) Law and Economics. I aim to unravel the intricacies of decision-making processes and dynamics in these complex domains.

In the realm of the Economics of Science and Innovation, I delve into the black box of innovation, examining key parameters shaping my choices. Building on my earlier foundational work, I plan to explore the selection of research questions based on existing knowledge and the subsequent organization of the innovative process. The project expands to develop a flexible model of science funding, evaluating potential policy shifts to address global challenges such as climate change. Collaborative efforts investigate the efficiency of research clustering, considering the tradeoffs faced by non-superstar researchers and the challenges posed to superstar scientists.

To understand the development of Ideas, I integrate insights from the scientific research model with findings from the experimentation literature. I explore the influence of "null results" on knowledge advancement, but also strategies for communicating complex skills in principal-agent relationships. The research extends to examining a principal's incentive to endorse seemingly distant agents, providing insights into team composition and power dynamics within diverse teams.

Competition and Coordination form the third pillar of research, building on my prior work on firms coordinating on standards. Ongoing research explores the impact of competition on knowledge advancement in multi-product markets, aiming to construct a comprehensive model incorporating direct competition, thereby accommodating various directions of innovation simultaneously.

Within Law and Economics, I investigate the broader impact of law beyond formal legal proceedings. Focusing on evidence and information, we explore the strategic value of evidence in legal contexts and ongoing work examines the impact of bankruptcy laws on the relationship between firms and banks. Moreover, I explore the role of pre-negotiations in institutional design, aiming to characterize tradeoffs between screening intensity and leniency.

This comprehensive research program promises to provide novel perspectives on classical moral hazard problems, shed light on team composition dynamics, and offer insights into the intricate relationship between law and strategic decision-making in economic contexts. The outcomes are anticipated to contribute significantly to the fields of organizational economics, science, innovation, and law, with potential implications for policy and practice.

**Resumen del Currículum Vitae:**

Johannes Schneider is an Associate Professor of Economics at the University Carlos III in Madrid since June 2023 before that he was an Assistant Professor at the same institution from Fall 2016 onward. He studied economics in Germany and Italy graduating from the University of Freiburg. He holds a PhD in economics from the University of Mannheim. Johannes holds broad research interest within the field of Microeconomic Theory with applications to Innovation, Industrial Organization, Law and Economics, and Political Economy.

One strand of his work is concerned with exploring the possibilities of regulation in a broader strategic environment. In particular, he is concerned how privacy concerns and information externalities influence player's compliance with regulation.

The other part of his work addresses dynamic decision making and innovation. In particular, he is concerned which projects are selected for innovation and which innovation techniques the innovators apply over time.

Johannes' s work has been published in leading Journals in Economics and he was able to secure several competitive grants such as the Juan de La Cierva 2020, A Walther-Benjamin Scholarship from the German Research Foundation (which he declined), and Marie-Curie Global Fellowship. He has held a visiting appointment in Mannheim and is currently visiting Bern as part of the Marie Curie Action.

Johannes has contributed to uc3m' s PhD program by teaching Information Economics to the PhD students in the years 2017-2021, the Microeconomics Reading Group for PhD students from 2018-2021 and helped supervising PhD students in the Microeconomic group of Carlos III de Madrid. Specifically, he has worked with and written recommendation letters for the Economic job market for Álvaro Delgado-Vega (first position: Assistant Professor TT U Chicago Harris) and Alejandra Agustina Martinez (first position: Lecturer U Leicester). He has also been part of the examination committee for Álvaro' s dissertation. In addition, Johannes was involved in the committees for Master dissertations, has been a mentor for first-year PhD students, and has written numerous letters of recommendations for students that used them to enter top economics PhD programs worldwide or to secure funding for their studies.

Johannes served as an area coordinator for the Annual Conference of Law and Economics, has refereed for numerous leading economic journals such as American Economic Journal: Microeconomics; Journal of Economic Theory; Journal of Law, Economics, and Organization or the RAND Journal of Economics. He has also acted as an academic expert discussant in the annual conference of the Association for Competition Economics. His paper Persuading to Participate: Coordination on a Standard (joint with Benjamin Balzer) won the Best Theory Paper in the International Journal of Industrial Organization in 2021.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** **Economía**
**Nombre:** GARCÍA HOMBRADOS, JORGE
**Referencia:** RYC2023-043981-I
**Correo Electrónico:** jorge.garcia.hombrados@gmail.com
**Título:** Memoria RyC2023 Jorge Garcia Hombrados
**Resumen de la Memoria:**

I will pursue research along two lines:

A) THE EFFECTIVENESS OF POLICIES TO FIGHT TRADITIONAL HARMFUL NORMS? These research projects will extend the work I developed in recent years, which focused on the consequences of some of these harmful norms including female genital cutting in Senegal (García Hombrados and Salgado, 2023, WBER), the child marriage in Ethiopia (García Hombrados, 2022, JPopE), and abduction marriage in Ethiopia (Garcia Hombrados and Novak, 2024). These projects were funded by various research grants, including the JIN Retos de Innovación grant (2021-2024) and the Madrid Grant to Young Researchers (2022-2023). These projects will investigate the effectiveness of interventions promoting cultural change such as the expansion of 3g technology, advocacy campaigns, and the involvement of religious leaders, on the support for and the prevalence of these traditional harmful norms. These research projects will use rigorous quasi-experimental designs (difference-in-differences or regression discontinuity designs) and Demographic and Health Surveys from sub-Saharan Africa as the main source of data.

The fight against harmful traditional norms in general and female genital cutting in particular is at the top of the policy agenda of many governments and international organizations (UNICEF, 2016). We believe the results from these studies will generate key evidence on what works to fight female genital cutting. To make sure the results of this study can help the design of effective anti-FGC interventions, we will prepare policy briefs summarizing the main implications of our studies and share them with key policymakers and institutions. Additionally, we plan to publish posts on research dissemination blogs (VoxDev, the World Bank Blog, Nadaesgratis) and engage with the media as part of a comprehensive dissemination strategy.

B) SOCIAL CAPITAL, TRUST IN FORMAL INSTITUTIONS AND CRIME IN AREAS WHERE THE STATE᾽S CAPACITY TO ENFORCE THE LAW IS LIMITED. These research projects will build upon my previous work, examining the effect of the Evangelical church on recidivism outcomes (Barrios and García Hombrados, 2024; JOLE) and the effect of natural disasters on social capital and crime (García Hombrados, 2020; JEBO). Due to contextual knowledge and data availability, the analysis will focus on poor areas of Chile. I will utilize rarely available data, including linkable administrative information on the entire population that entered prison, a database containing the geolocation of reported crimes and arrests in Chile, geolocated information on non-profit organizations, geolocated census data, and linkable administrative educational records.

Crime is consistently cited as one of the primary concerns among citizens in Latin American countries, and its reduction remains a key objective for many nations. We believe that the results from these studies can provide valuable insights to shape effective anti-crime policies. To achieve this objective, we will prepare policy briefs summarizing the main implications of our studies and share them with key policymakers and institutions. Additionally, we plan to publish posts on research dissemination blogs (VoxDev, the World Bank Blog, Nadaesgratis) and engage with the media as part of a comprehensive dissemination strategy.

**Resumen del Currículum Vitae:**

Jorge García Hombrados works as a JIN Retos de Investigación Fellow at the Universidad Autónoma de Madrid. He is also an IZA and GLO fellow and an invited researcher at J-PAL. Before joining UAM, he was a postdoctoral researcher at the London School of Economics. Previously, he worked for JPAL LAC and the International Initiative for Impact Evaluation (3ie). Jorge completed a PhD in Economics at the University of Sussex in 2018. He is an applied microeconomist, and his research focuses on topics in development economics, cultural institutions, crime, and the evaluation of social policies. His research has been published in top-field journals such as the Journal of Labor Economics and the Journal of Development Economics. His research has also received media coverage from El País, El Mundo, La Vanguardia, expansión, or Le Monde, among others. He is a regular contributor to the leading blog of research dissemination in Spanish, www.nadaesgratis.com. Jorge's research has received different awards, including the I Prize Nada es Gratis for Job Market Candidates, the Papers, the FEDEA prize for the best paper by a young researcher presented at the AES meeting, or the research excellence award at the Faculty of Economics of the Universidad Autónoma de Madrid.

**Área Temática:** **Economía**
**Nombre:** ORTIZ MUÑOZ, MARCELO IGNACIO
**Referencia:** RYC2023-044281-I
**Correo Electrónico:** marcelo.ortizm@upf.edu
**Título:** Corporate Governance and Accounting

**Resumen de la Memoria:**

I have worked as an Assistant Professor at Universitat Pompeu Fabra since March 2019. Additionally, I hold affiliated positions at the Barcelona School of Economics (BSE) and the UPF Barcelona School of Economics. In 2019, I received my PhD in Finance from Adolfo Ibañez University and visited Erasmus University in 2018. Before starting my academic career, I worked as a Financial Trader at the ITAU Bank in Chile for five years.

I earned my PhD only four years ago, but my academic work has already gained recognition. I have published four papers in international peer-reviewed journals, 3 of them in the FT 50 top journal list. In particular, my work has been published in leading journals in Finance and Management, such as The Review of Financial Studies, Entrepreneurship Theory and Practice (2x), and Global Strategy Journal. Given my work on family firms, I was invited to write a chapter in the Encyclopedia of Family Business. I am invited to revise and resubmit my work at the European Accounting Review.

I have presented my research at 18 international conferences and given ten invited seminars. As part of this research agenda, I have developed international collaborations with eight co-authors from 7 different institutions in the United States, Canada, United Kingdom, and France. Moreover, I am fortunate to be part (as a research team member) of a Spanish Ministry of Economy and Competitiveness Grant.

I have co-organized the Barcelona Accounting Seminar and Workshop with colleagues from ESADE Business School since 2019. The primary objective of this initiative is to provide a platform for top accounting researchers to share and discuss their latest work with the local accounting community in Barcelona. We have successfully hosted researchers from Harvard University, Chicago University, and the London School of Economics, among others. These events have been the starting point for several collaborations and visiting invitations for our faculty and PhD students. Relatedly, despite being a junior researcher, I have been invited to be part of the scientific committee of the European Accounting Association Annual Congress, and I am a regular evaluator in Chile's National Research Agency (ANID).

**Resumen del Currículum Vitae:**

My research focus is on the intersection between corporate governance and accounting. In my work, I use or create large new datasets to answer important questions motivated by economic and management theories. My work is divided into three research lines: family firm, transparency regulation, and corporate tax strategy.

Family Firm: It examines the influence of family characteristics and events on corporate decision-making in family-owned businesses. I collected data on 170 business families, tracking various aspects such as marriages, divorces, education, and political involvement. My work studies governance structure in controlling coalitions (ETP 2020), social elite status (ETP 2024), and the impact of inheritance law on corporate governance (GSJ 2021). Future projects involve studying corporate consequences of family political ties, corporate responses to sociopolitical crises, and the role of women in governance.

Transparency Regulation: This research evaluates the impact of EU reporting directives on private firms, particularly on the market of corporate control (RFS 2023) and risk management (R&R at EAR). Future work includes studying the effects of reporting regulation on the labor market for top executives, focusing on how it influences the identification and replacement of CEOs.

Corporate Tax Strategy: My most recent line focuses on corporate governance and tax strategies, particularly in offshore centers and tax havens. Using novel data collected from offshore leaks and business registries, my research uncovers private companies' widespread use of offshore entities in Europe (Working Paper, 2023). Future projects aim to dissect the impact of offshore finance on corporate governance and study managerial incentives in tax avoidance using a moral hazard model.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Economía** |
| **Nombre:** | RIGHI , CESARE |
| **Referencia:** | RYC2023-045885-I |
| **Correo Electrónico:** | cesare.righi@upf.edu |
| **Título:** | Economics of innovation and intellectual property strategy |

**Resumen de la Memoria:**

My research investigates the economics and management of innovation, intellectual property rights, and technology standards. My main research stream studies the patent system and patentees' strategic behavior; in a second stream, I investigate the effects of investments in information technology (IT) on firm performance and competition.

My research on patents includes several published and working papers. Three of them study the use of continuations, one of the most controversial aspects of the U.S. patent system. In a first paper, I study the use of continuations to obtain protection for technology developed after the original filing date of a first patent, in an attempt to increase licensing revenues, focusing on the standardization process in the information and communication technology sector. In a second paper, I update the evidence on the use of continuing applications after two reforms significantly altered the U.S. patent system and eliminated the most extreme "submarine patenting" often associated with continuing applications. I argue that continuing applications retain a subtle use, as applicants can use them to change patent scope after locking in gains with an initial patent. In a third paper, I provide evidence on the link between continuations and litigation, and exploit the pre-grant publication of patent applications along with the timing of continuation grant, as well as an instrumental variable strategy based on changes in examiners' granting proclivity to show that continuation grant increases litigation. In an early-stage project on patent litigation, I study under what conditions an operating company outsources patent enforcement to a patent assertion entity.

In another paper, I show that subtle differences in patent disclosure rules of standard setting organizations correlate with the type of disclosed patents, the terms of licensing commitments, and ultimately long-run patent citation and litigation rates. In a related working paper, I use data on standard essential patents to study the effects of standardization on the scope of cumulative inventive activity. I have also written a book chapter that reviews the empirical literature on standards' role in cumulative innovation. Finally, another paper on the patent system analyzes the matching of patent applications to examiners at the U.S. Patent and Trademark Office and derives implications for research designs based on differences in examiners' behavior and characteristics.

I will extend this line of research studying the impact of startup's patents on establishing relationships with Corporate Venture Capital investors, the impacts of the opening of regional offices of the USPTO on innovation and entrepreneurship, and the effect of the acquisition of a startup on the use of continuations for patents in the startups' portfolio. Moreover, I will expand my research from patenting to the drivers of different types of inventing activity by studying how different management practices lead to different types of inventions.

Two working papers in my research stream on the effects of firms' large IT investments (i) analyze the link between large custom software investment and employment, productivity, and revenues, and (ii) show that investments in software by dominant firms are associated with greater persistence of industry leaders.

**Resumen del Currículum Vitae:**

I study the economics and management of innovation and technology, intellectual property rights, and technology standards. My goal is to contribute to strategy research while remaining relevant to policymakers. My main research stream studies the patent system and patentees' strategic behavior; in a second stream, I study the effects of investments in information technology (IT) on firm performance and competition.

My work on patents includes several published and working papers. In an article in Research Policy, I analyze the matching of patent applications to examiners at the US Patent and Trademark Office (USPTO). Prior studies suggested that this matching is more-or-less random within USPTO units and leveraged this assumption to estimate patents' impacts. My paper is the first to systematically test the 'random matching' hypothesis across all USPTO units, providing evidence against this assumption. In other papers, I study the use of continuations, which are one of the most controversial aspects of the US patent system because they allow inventors to change patent boundaries, leading to concerns about inadvertent infringement, hold-up, litigation burdens, and monopoly power. One of my articles (in the RAND Journal of Economics) examines the use of continuations to obtain standard essential patents (SEPs) that are infringed by already-published standards. The evidence I provide in a related Research Policy article suggests that continuations are used strategically to craft patents over time, and in a related working paper I focus on their impact on patent litigation, showing that continuations have likely fueled the recent US patent litigation explosion. In another working paper on patent litigation, I study under what conditions companies outsource patent litigation and the consequences of such practice. In another Research Policy article, I show that differences in patent disclosure rules of standard setting organizations correlate with the type of disclosed patents, the terms of licensing commitments, and long-run patent citation and litigation rates. In a related working paper, I use data on SEPs to study the effects of standardization on the scope of cumulative inventive activity.

Two working papers in my research stream on the effects of firms' large IT investments (i) analyze the link between public companies' large custom software investment and employment, productivity, and revenues, and (ii) show that investments in intangibles (especially software) by dominant firms are associated with greater persistence of industry leaders.

My current projects received funding from the Spanish Ministry of Science and Innovation, and the Barcelona School of Economics (BSE).

I currently organize the UPF management seminars and the BSE SF workshop on the Economics of Science and Innovation.

I have presented my work at leading research institutions and conferences, and I have also disseminated my findings beyond the academic community via non-technical summaries.

I teach undergraduate and graduate classes, and I co-teach an elective on Business Economics and Management in UPF's Master of Research in Economics, Finance and Management (2nd year of the PhD program).

I serve as a referee for leading journals in management and economics, and for leading conferences in management and innovation.

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| **Área Temática:** | **Economía** |
| **Nombre:** | SALISH , NAZARII |
| **Referencia:** | RYC2023-044391-I |
| **Correo Electrónico:** | nsalish@eco.uc3m.es |
| **Título:** | High-Dimensional Data Analysis with Applications to Climate Change |

**Resumen de la Memoria:**

To date, my contributions to the fields of econometrics and statistics encompass three distinct directions: panel data models, functional data analysis, and time series analysis.

In the realm of panel data analysis, I explored questions related to slope heterogeneity, contributing to the literature with a new inference procedure and estimation method that relaxes standard key restrictions on homogeneous slope coefficients. Notably, this research resulted in collaborative publications with Joerg Breitung in both a general interest journal and a top field journal in econometrics.

In the domain of high-dimensional or functional data analysis, I focused on understanding time dependencies between functional observations representing large datasets. This led to the development of statistical tools providing a simple yet comprehensive framework to quantify time dependencies in functional time series, which can be used to develop new theoretical and methodological approaches.

My third area of interest within econometrics and statistics is time series analysis, involving collaborations with Matei Demetrescu. Our work provided practitioners with guidelines on the significance of structural breaks in Vector Autoregressive (VAR) models, addressing critical questions about when and to what extent structural breaks can be overlooked. Furthermore, we presented a practical solution for testing no cointegration in VAR models with an estimated degree of fractional integration. Jointly with Paulo Rodrigues, we devised a threshold model tailored for unconventional time series data represented in the form of intervals.

Looking ahead, my research agenda builds on the directions described above and encompasses three primary objectives: theoretical, empirical, and software development. On the theoretical front, my focus lies in constructing general and adaptable frameworks for modelling high-dimensional or functional data, with a specific emphasis on temporal dependence. This research agenda extends beyond pure theoretical interest. In the field of climate and environmental data analysis, existing tools for data processing are often found restrictive, failing to account for the complex nature of such datasets. These limitations create a compelling opportunity to apply newly developed statistical tools and potentially enhance the analysis of climate and environmental data. To bridge the gap between theoretical developments and practical applications, my agenda includes the creation of a user-friendly software package using established platforms like R and Matlab. This package aims to facilitate the application of the methodology, encouraging practitioners to adopt the tools developed in the course of my research

**Resumen del Currículum Vitae:**

After obtaining my Bachelor's degree in Mathematics from Lviv National University, I pursued dual Master's degrees. In 2008, I earned a Master's in Mathematics and Statistics from Lviv National University, followed by a Master's in Economics from the University of Algarve in 2010. To support my second Master's degree, I secured an Erasmus Mundus External Cooperation Window grant.

In my academic journey, I received a doctoral scholarship from the German Research Foundation and completed my Ph.D. at the Bonn Graduate School of Economics in 2016. Throughout my graduate studies, I gained international professional experience as a research assistant at various institutions, including the University of Cologne and the University of Kiel. Subsequently, in 2016, I joined the Department of Economics at the University Carlos III de Madrid as an Assistant Professor and was later promoted to Associate Professor in 2022.

During my tenure at UCM3, I have obtained and actively participated in various grants to support my research. My research interests primarily focus on econometrics and statistics, with a specialization in functional data analysis, panel data models, and time series analysis. I have made substantial contributions to these fields, publishing six articles in international journals and contributing a chapter to a book. Notably, four of these publications are in the first JCR Quartile, and two are in the second JCR Quartile.

In addition to my publications, I have presented my work at numerous international conferences and department seminars. Furthermore, I have actively contributed to the scientific community by serving as an anonymous referee for several top journals in Econometrics and Statistics. Additionally, I have organized research seminars and international workshops, further enhancing the exchange of knowledge and ideas within the academic community.

**Área Temática:** **Economía**
**Nombre:** MILAN SOLE, PAU
**Referencia:** RYC2023-045060-I
**Correo Electrónico:** pau.milan@gmail.com
**Título:** Risk-Sharing Networks, Incentives, Information Constraints, and Optimal Design of Policies in Village Economies

**Resumen de la Memoria:**

My research analyzes the role that complex interaction structures play in determining individual choices and aggregate outcomes in a variety of economic contexts. I explore various aspects of the economy, including collective action, technology adoption, innovation, social assimilation, and risk-sharing, with a particular emphasis on scenarios where interactions do not conform to the traditional assumption of anonymous members in large groups. Instead, the analysis draws from social and economic network theories to enhance the understanding of outcomes and optimal policy in these settings. The overarching objective is to improve on existing policy targets by leveraging the rich heterogeneity provided by network data.

A large part of my research agenda focuses on the distribution of risk under constraints. In a paper now published at The Review of Economic Studies, I focus on risk-sharing transfers that rely on how information is scattered across the population. I take any information network as given and consider efficient transfers that respect local constraints. This paper is now cited by the world's top researchers in development economics (and many in network theory) because it is the first to characterize a full set of pareto efficient bilateral transfers for any arbitrary network. It opens the door to many important applications, not least of which is how to optimally target development policies, such as cash subsidies or information campaigns by local governments or NGOs. Finding optimal targets is an exciting new field in development economics which attracts a great deal of attention. As I detail in the project description, many interesting new research directions (some theoretical and some empirical: with various groups of interested co-authors) have grown out of this first contribution.

I also plan to contribute to this policy debate by focusing on the case of fertilizer subsidies in rural Malawi. To do this, I began an international data-collection project in 2009 that collects detailed survey data on productivity, consumption, land management, and bilateral transfers. This data allows us to analyze the impact of targeted fertilizer subsidies on various economic factors, including consumption patterns, technology adoption, and more importantly the degree of government crowd-out. We plan assess different targeting alternatives to enhance program efficiency, measuring the consumption-equivalent welfare impact of each dollar spent on subsidizing fertilizer.

I'm also working on a different aspect of optimal interventions: the design of incentive contracts in networked firms, where productivity spillovers exist among workers. The organizational structure is modeled as a weighted network of workplace relationships. The study aims to determine how optimal wage compensation should be designed, considering workers' positions within the firm's network. As workers are risk-averse, the optimal contracts must simultaneously incentivize and insure them. The focus extends to situations where similar contracts must be offered to workers occupying different positions in the network, exploring the implications of connectivity variations within groups. This research provides insights into how to assign incentives, train workers, and optimally allocate responsibilities within a firm.

**Resumen del Currículum Vitae:**

I completed my doctoral thesis at Pompeu Fabra University, under the supervision of Jan Eeckhout. During my last doctoral year, I was a visiting scholar at the University of Cambridge, hosted by professors Vasco Carvalho and Sanjeev Goyal. In 2016 I became a research fellow at MOVE financed by Albert Marcet's ERC grant I also accepted a position as Assistant Professor of Economics at UAB. I was granted tenure at UAB around a year ago. I have taught at the UAB doctoral program (IDEA) and at the Barcelona Graduate School of Economics, where I am an affiliated professor. I am a member of the scientific board of the Coalition Theory Network (CTN), and I am co-director of the BSE graduate program in Data Science for Decision Makers.

I have participated in several international conferences —UCL-London, NES-Moscow, Paris- Sorbonne, ASSET-Florence, CESC, Adansonia-Milan, ASSA-Chicago, ENTER-Tillburg, NYU-AD —and I have been invited to give several talks in different departments —Cambridge, University, University of Geneva, Glasgow University, Bocconi University, Aix-Marseille School of Economics, NUS-Singapore, IFS-London, Univ of Sao Paulo, PUC Chile, among many others. I organized the microeconomics seminars at UAB for 5 years. In 2019 I co-founded and still organize a yearly international workshop on networks at the BSE Summer Forum. I have refereed for many top scientific journals (including top 5 journals like Econometrica and the American Economic Review) and I have been asked to be an external evaluator for the ERC Consolidator grants. I have directed 14 master theses and three PhD theses. I am currently advising three ongoing PhD students.

I work primarily in the field of economic and social networks focusing on the mechanisms for the transmission of information, incentives, and insurance. My work focuses particularly on social aspects, such as informal insurance in primitive societies, collective action, or social integration in communities. The emphasis is not only on normative properties (equity and efficiency) but also on the strategic incentives that yield decentralized equilibria.
In recent years I have begun several collaborations with different sets of coauthors that together build a broad research agenda (both theoretical and empirical) on how risk sharing arrangements are shaped by local constraints. I consider feasible insurance arrangements when each agent's risk can only be shared among a personalized subset of agents. My coauthors and I are developing an incomplete markets model where agents have differential access to a set of contingent assets that pay on events determined by the joint realization of their neighbors' incomes. I am also exploring the implications of this theoretical framework using unique datasets from Tanzania, Bolivia and Malawi. I work with a diverse group of co-authors from around the world including Yale University, University of Pennsylvania, Duke University, UC Santa Barbara, Carlos III, National University of Singapore, University College London, and colleagues in my own department at Universitat Autònoma de Barcelona.

In a separate research strand, I explore the effects of networked interactions in designing optimal contracts, as well as the incentives to innovate on complex supply chains. I am also studying how to measure polarization under complex social structures.

My research has been published in top journals: Restud and GEB.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | DE LA CALLE ALONSO, ALBERTO |
| **Referencia:** | RYC2023-044283-I |
| **Correo Electrónico:** | alberto.delacalle@csic.es |
| **Título:** | Concentrating solar thermal technology for electricity production and process heat |

**Resumen de la Memoria:**

Solar energy has the capability to meet worldwide energy needs in an eco-friendly approach, relying on just a portion of arid regions. The main challenge lies in devising a cost-effective and efficient means to transmit this energy to the market precisely when and where needed. The decreasing cost of photovoltaics (PV) makes solar the most economical energy source, but challenges like variability necessitate progress in electrical storage. On the other hand, concentrating solar thermal (CST) power plants offer dispatchable electricity with flexible and relatively economical thermal energy storage, but approximately six times higher cost than generating electricity through PV without storage.

While electricity's share in world energy consumption reached 20% in 2023, process heat constitutes nearly half. CST technologies can provide high-temperature, storable process heat for various industrial applications. Thermochemical energy storage, solar fuels production (particularly $H_2$ and/or CO), and chemical production are promising CST applications.

Thermochemical energy storage allows the conversion of concentrated solar heat into chemical energy, offering high energy density and potential for extended storage durations. Solar fuels production offers a long-term solution for storing and transmitting intermittent solar energy, with the thermochemical route holding significant potential. Chemical production using CST technologies has recently advanced in sectors like aluminum, cement or ammonia production, but challenges include large-scale operations and limited adaptability to intermittent renewable energy.

My proposal aims to advance CST research lines, focusing on:

1)Designing and testing solar counter-current reactors for water splitting or thermochemical energy storage, aiming for a 5-fold increase in efficiency compared to existing technology.

2) Thermo-electro-chemical water splitting, using a localized electric field to reduce operating temperatures, with plans to design and build a solar reactor.

3) Developing weekly and seasonal energy storage solutions, combining two thermochemical cycles for versatile heat or $H_2$ production.

4) Advancing solar thermochemical ammonia production by exploring low-cost quaternary nitrides for candidate selection, leveraging AI tools and DFT.

Additional proposals include revalorizing biodiesel production waste, introducing a localized electric field during thermochemical water splitting, and conducting techno-economic analysis for a solar thermal power plant with Ca-looping thermochemical storage and a supercritical $CO_2$ Brayton cycle. The overarching goal is to contribute to the commercialization of these technologies.

**Resumen del Currículum Vitae:**

For the last thirteen years, I've specialized in solar thermal energy research across global institutions. Starting at Spain's CIEMAT-PSA and CIESOL (2010-2015), including a stay at ETH Zurich (Switzerland), I then moved to Australia's CSIRO (2016-2019), the US's Arizona State University (2019-2023), and recently returned to Spain at ICP-CSIC (since April 2023). My educational background includes a B.S. in Physics (UCM, 2008), M.S. in Applied Physics (UCM, 2009), and a PhD in System and Control Engineering (UNED, 2015, with Extraordinary Award). My PhD, pursued at CIEMAT-PSA, was funded by a prestigious FPI fellowship. Subsequently, I served as a Research Assistant at the University of Almeria for 9 months, contributing between both contracts to 4 research projects (2 European, 2 national).

My international mobility is significant with nearly 7 years (82 months) in Switzerland, USA and Australia. First, I performed a 3-month predoctoral research stay at ETH Zurich (Switzerland) with Pr. François E. Cellier (funder developer of Modelica language). Afterwards, I joined the Solar Thermal Processes team of CSIRO (Australia), the Australian public research organization as Postdoctoral Fellow. Here, I was part of the ASTRI team, a $100 million research program and collaborative network to promote the development of the next generation of CSP. At CSIRO, I worked on 2 projects where I led the modelling work. I was awarded with 3 internal CSIRO funded projects (AU$9,000 each) which I led as PI. I drove the development of SolarTherm, an open source simulation platform for CST power systems, which overperform commercial tools. In August 2019, I joined ASU LightWorks® at Arizona State University (USA) as a Postdoctoral Researcher and subsequently I was promoted to Assistant Research Scientist, at the group of Pr. Ellen Stechel (world leading researcher in solar thermochemistry). At my group at ASU, I led and coordinated all the modelling activities in 4 projects funded by the Department of Energy (DOE), being Co-PI in one of them. My responsibilities included reporting and presenting my work to the DOE review committee, training and supporting students as well as other faculty members from ASU and other research institutions or companies, seeking and attracting new public and corporate funding opportunities.

In 2023, I moved to ICP-CSIC via Talent Attraction Program funded by Madrid Region Government for exploring counter-current reactors for thermochemical water-splitting, being awarded with a ~€462,000 project of which I am PI. Currently, I am directing the doctoral thesis of Raúl Peño (UAM) and co-directing with Prof. Rodrigo Escobar the doctoral theses of Freddy Nieto and José Luis Jinés at UC, Chile (both students to finish in 2024). In summary, I have published 32 scientific articles (13 Q1 and 6 Q2), 1 article with IF 23; first author in 9 and corresponding author in 7. I have published 1 book as first author. My h-index is 15 and I have 597 citations (source Scopus 01/24/2023). I collaborate with 37 co-authors in over 15 instructions in 6 countries. I did more than 50 contributions in international and national conferences and awarded in 3 of them. I have supervised 3 Bachelor Thesis and 1 Master Thesis; I am currently supervising 1 Bachelor student and 3 PhD students. I was interviewed twice in the SolarPACES website. I have done 44 reviews in 7 JCR journals, and I am member of the Scientific Committee of SolarPACES since 2017.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | BORRI , EMILIANO |
| **Referencia:** | RYC2023-044196-I |
| **Correo Electrónico:** | emiliano.borri@udl.cat |
| **Título:** | Development of thermal energy storage for liquid air energy storage applications |

**Resumen de la Memoria:**

The main line of research that the candidate will develop if this project is funded will be the development of thermal energy storage solutions for a liquid air energy storage (LAES) system. This activity will combine the unique expertise of the candidate on LAES acquired during the PhD and the research stays at Nanyang Technological University and University of Birmingham to the strong expertise on thermal energy storage that GREiA research group growth in the last 20 years. LAES uses liquid air as an energy vector to store electricity from the grid. This system is made of a charging section where a liquid air is produced, a storage section where the liquid air is stored at cryogenic temperature and a discharge section where the liquid air stored is heated up and expanded when electric power is needed. It is well known in the literature that thermal energy storage (TES) is a pivotal component to increase the system efficiency to be competitive with other storage solutions. TES can recover the cold energy rejected from the LAES to decrease the energy consumption to produce liquid air and/or to provide cooling in buildings or data centres. Similarly, the heat rejected during the liquefaction can be also recovered to increase the power produced during the discharge. The literature shows a research gap into the development of TES for LAES with the main challenges related to the temperature range of operation. The use of phase change materials (PCMs) is a good option to increase the energy density thus the storage size and costs, but the main drawback is the low thermal conductivity. The main aim of this research will be to design a TES able to maximize the cold and hot energy recovery from the LAES and increase the round-trip efficiency compared to the actual state of the art which nowadays is around 50%. The focus of this research will be on the design of the TES tank to optimize the heat transfer between the storage material and heat transfer fluid overcoming the problem of low thermal conductivity of PCMs. Another focus will be to integrate in the TES system for LAES the concepts of modularity and cascade. Modularity can help to maximize the power discharged by the thermal energy storage and increase the efficiency in partial loads operations. The cascade concept, on the other hand, aims to develop a storage concept using PCMs with different properties which can maximize the discharge efficiency reducing the temperature gradient between the storage material and the heat transfer fluid. Advanced simulation and modern techniques such as the support of artificial intelligence (a key expertise of some colleagues at GREiA research group) will be used for both design and optimization of thermal energy storage. The final aim of the work will be the production and the lab-testing of an optimized TES which could be scaled up and integrated in real LAES applications. In this case a dedicated test rig will be built to test a lab scale prototype of TES. In order to evaluate the impact on the new developed TES on LAES a numerical platform will be developed. Moreover, the results of the simulation will be used to carry out both environmental and economic assessment.

**Resumen del Currículum Vitae:**

Emiliano Borri graduated from Università Politecnica delle Marche (Italy) with a bachelor of Mechanical Engineering in 2013. In 2015, he earned the master degree in Mechanical Engineering with honours with the final project developed at the Istanbul Teknik Universitesi (Turkey). In February 2019, he earned the Ph.D. in Industrial Engineering at Università Politecnica delle Marche. The research activity was focused on the study of liquid air energy storage and the characterization of low-temperature phase change materials. During his Ph.D. he collaborated with Nanyang Technological University (Singapore) and University of Birmingham (UK) where he spent 14 months at and 3 months as a visiting researcher in the two institutions respectively. Since April 2019 he is a post-doctoral researcher at the GREiA research group at the Universitat de Lleida head by Prof. Luisa F. Cabeza working in the field of thermal energy storage where the group has an international prestige in this field. During his postdoc he developed technical management skills supporting the management and coordination of several EU funded projects including SWS-Heating (GA 764025); SolBio-Rev (GA 814945); CO-COOL (GA 101007976); HYBRIDplus (GA 101084182); ThumbsUp (GA 101096921); SUSHEAT (GA 101103552); Emiliano contributed also to the writing of proposal which were successfully funded BIOBUILD (GA 101135629). Emiliano also collaborates to the research networks RedTES (Red de Almacenamiento de Energía Térmica) and Task 67/Annex 40 "Compact Thermal Energy Storage Materials within Components within Systems". His research skills also include the development of test-rig for thermal energy storage, the design of experiments, experimental testing and sustainability life-cycle assessment (life-cycle analysis, life-cycle cost, social life-cycle assessment). During his postdoc he spent 3 months in 2022 and 3 months in 2023 at Nanyang Technological University (Singapore) under the project CO-COOL (GA 101007976) giving also a workshop in thermal energy storage. Since 2021 he is lecturing at the University of Lleida de curse "Sustainable construction 1" and coordinated by Prof. Luisa F. Cabeza. Since 2022 he is also a lecturer in the senior program of the University of Lleida with the subject "Methodology of research and group team work" and "Alternative energies". During his research career he authored 37 documents with 766 citations and h-index 15 based on Scopus database. He attended in person several conferences dedicated to thermal energy storage and energy systems being involved in the organization of the Eurotherm Seminar #116 in Lleida, Spain (out of which today he is managing guest editor of the special issue in the Journal of Energy Storage). Emiliano also organized dissemination events for society including the yearly European Researcher's Night at the University of Lleida. Emiliano served also as a reviewer and guest editor in special issues of high-quality scientific journals related to the topic of energy storage including Journal of Energy Storage (Elsevier), Energies (MDPI), and Sustainability (MDPI). He also works as an expert in energy systems for institutions affiliated with the European Union, with a specific collaboration with the Joint Research Center (JRC) in the NetZeroCities project, aiming to support and create 100 European cities with zero climate impact.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | MARTÍNEZ  ALANIS, PAULINA RAQUEL |
| **Referencia:** | RYC2023-042982-I |
| **Correo Electrónico:** | pmartinez@irec.cat |
| **Título:** | Scientist in the field of nanomaterials for renewable energies |

**Resumen de la Memoria:**

Graduated in chemistry in 2005 from School of Chemistry of the National Autonomous University of Mexico (UNAM). After that, I conducted my PhD studies in the Chemistry Science Program from UNAM and graduate with Honors in 2012. I¿m more than willing to tackle problems involving a multidisciplinary approach in an organized and productive way. My research stays at Aalto University (2021-2022) the University of Barcelona (2016-1018), UNAM (2013) George-August University of Gottingen (2012), and my research stays in Max Born Institute in Berlin (2019), and University of California at San Diego (2016) had contributed in my training as a researcher. I¿m passionate about understanding the structure of nature along with its physical and chemical properties. I am also very interested in the study of nanomaterials for electrodes, particularly those with potential applications in add values bio-bases chemicals and materials, renewable energies and gas sensing. Since the beginning of 2022, I'm Deputy Head of Functional Nanomaterial Group, one of the 7 research groups of the public Catalonia Institute of Energy Research in Barcelona, Spain. Regarding my record in scientific publications, I have a total amount of 42 papers published (H index 13, i10-index 21) in journals such as Sensors and Actuators B: Chemical (IF 9.221), and Materials Today Nano (IF 18.962), and like corresponding author in Chemical Engineering Journal (IF 16.772), and Nano Energy (IF 19.069). These scientific production shows a constant increment in citations (783 cites) and papers published per year during the last 8 years. Also, another parameter of the quality of my work is that 75% of my papers were published in first quartile journals, and the 85 % of my total production was in the first and second quartile journals. I participated in 17 international conferences, 80 % of that as oral and oral invite and I was invited to impart 5 seminars, two of them in   Chongqing University of Technology (2022 and 2023), two seminars in Aalto University (2022) and one in the in Max Born Institute for Nonlinear Optics and Short-Pulse Spectroscopy (2019).

**Resumen del Currículum Vitae:**

Respect national or international projects, I participated in 16 projects, 2 as IP, 1 as WP leader and 13 as team. I was conducted knowledge and technology transfer and research project managing activities and courses in the framework as beneficiary in the TECNIOSPRING Program in 2021 as IP of the project "WINE-EVIB Electrochemical valorization of wine industry byproducts". During the last year, I was improving mi projects sustainability strategy following the European guidelines for the Agenda 2023, by my training in the prestigious business school of ESADE, in Barcelona. In the past 3 years, I was closely working with European industries in the fields of thermoelectric materials, sensors, chemicals, construction, and food, by the confection of proposal for the Horizon Europe Calls with a 33% of successful. Also, I did project management actions as WP leader in the ERA-MIN project "2BoSS Toward sustainable batteries based on silicon, sulfur and biomass-derived carbon project".

I am a dedicated scientist deeply committed to both education and research. Over the past 15 years, I have immersed myself in teaching, approaching my role with a profound sense of professionalism, fairness, sensitivity, dignity, and respect towards my students. To date, I have accumulated a substantial 1207 hours of experience lecturing in various university courses mainly in the University of Barcelona. From 2019 to 2023, I had the privilege of mentoring four Bachelor and four Master's students at the University of Barcelona, guiding them through their academic journeys. Currently, I am actively involved in co-directing the research paths of five Ph.D. students enrolled in the Doctoral Programs of Nanoscience and Electrochemistry, Science and Technology at the University of Barcelona. Beyond the academic realm, I find immense satisfaction in fostering a passion for science among students and general public. Throughout the year, I actively engage in numerous outreach and gender equality initiatives such as Nanoinventum, Cientifiks en Joc, and #100tifiques, Science Week, Forum of Spanish-Speaking Women in Europe, and 1st Latin American Entrepreneurship Fair. These activities allow me to contribute to the community and inspire the next generation of researchers.

I have been able to carry out innovative research in chemistry, materials science and applied physics, my areas of expertise. I visualize my future career as consolidate scientist conducting my research in the field of nanomaterials, not only by the perspective of basic science, but also by the implication of my research given new strategies for improve the sustainability of industrial processes. The multidisciplinary profile that I achieved during the last years allows me generate innovative and creative solutions to the challenges in my fields of study, according with the global environmental necessities.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | MADRID LOPEZ, CRISTINA |
| **Referencia:** | RYC2023-045720-I |
| **Correo Electrónico:** | cristina.madrid@uab.cat |
| **Título:** | Socio-ecosystem metabolism: assessing anthropic water and energy dependencies and their complex contribution to ecosystem impact and global change |

**Resumen de la Memoria:**

I am an international environmental scientist and educator working in the fields of human and industrial ecology. My pioneering research has substantially contributed to understand the dependencies of human activities on water and energy resources, and their impacts on ecosystem dynamics. This is evidenced by my DORA metrics: FWCI – 1st: 2.09, 22 JCR articles, 81% are in Q1, 50% in top 25% most cited documents, summing over 400 citations (SC, 870 on GS), some of my papers accounting for almost 200 citations. I have worked on three scientific contributions: C1: Advancing the understanding of socio-ecosystems; C2: Developing open-source socio-ecosystem and energy modelling to inform the energy transition; C3: Pioneering sustainability research based on social narrative assessment and citizen science. This research has been disseminated in 12 invited talks and presented at 37 international conferences. My contributions have shaped major projects like MAGIC and frameworks like MuSIASEM, showcasing my leadership and establishing significant international collaborations, with recurrent consortium members. Some of my outputs come in the form of datasets, interactive tools or GitHub repositories.

As a Junior Research Director at ICTA-UAB, I have independently raised about 1.6mil€of which 1mill€currently funds my 5 active projects, 2 of which are international (Horizon EU and EraNET), (plus 3 international projects finished). In those projects I have the role of project coordinator (LIVEN, ETOS, CCB30), UAB PI (JUSTWIND4ALL, SEEDS) and/or Work Package leader. Before being a director, I have also participated in 17 projects or contracts (MATISSE, CREPE, MAGIC, URBAG) to which I have done significant contributions, in which I had been acquiring increasing level of responsibility. Because of my leading rol in projects, my research stays and my collaboration in networks like COST actions, I have an extensive contact network, including 54 coauthors from 17 countries.

My research during the RyC grant will focus on the development of non-linear functions for the calculation of environmental impacts of energy systems based on the framework of the metabolism of socio-ecosystems. I will start by identifying the impacts over the land, the water bodies, the atmosphere and the human-health as well as their spatial-temporal dimensions that are relevant for different social groups using a crowd-source platform. Next, I will define and test non-linear functions and include them into the modelling of ENBIOS. Finally I will compare the results of the analysis with those of the non-linear analysis, to evaluate the benefit of non-linear methods for these methods. With this proposal I will integrate my current research lines, namely i) definition of the metabolism pf socio-ecosystems, ii) the socio-ecological assessment of energy transition scenarios and iii) the role of citizen science in improving socio-ecological assessment. As these lines have already opened ground for new approaches, joining them will ensure an innovative research contribution to the challenge of reaching an energy transition that avoids as much as possible future problems.

**Resumen del Currículum Vitae:**

As an international environmental scientist and educator, my work in human and industrial ecology has advanced our understanding of human impacts on water, energy resources, and ecosystems. My significant research output includes 22 JCR articles, with 81% in Q1 journals and 50% among the top 25% most cited documents, amassing over 400 citations on Scopus and 870 on Google Scholar. My key scientific contributions span socio-ecosystems, open-source socio-ecosystem and energy modeling, and sustainability research integrating social narrative assessment and citizen science. This impactful work is disseminated through 12 invited talks and 37 international conference presentations, shaping major projects like MAGIC and MuSIASEM and establishing extensive international collaborations.

At ICTA-UAB, I've successfully raised approximately 1.6 million euros, directly managing 1 million euros across 5 active projects, enhancing my leadership in coordinating projects like LIVEN, ETOS, and CCB30, and leading UAB's participation in JUSTWIND4ALL and SEEDS. My role in these projects, coupled with participation in influential networks like COST actions, has expanded my professional network to 54 coauthors from 17 countries.

My societal contributions bridge the gap between research and practical application, influencing policies like REWE's irrigation policy and Spain's PNIEC. I actively engage with various stakeholders, from international governments and agencies to local NGOs and schools, exemplified by the development of ENBIOS and my teaching initiatives. My projects emphasize citizen science, enhancing public understanding and participation in sustainable transitions.

In mentoring and training, I lead the dynamic LIVENlab at ICTA-UAB, mentoring a team of researchers and technicians. I've guided 3 PhD students to professional maturity and supervised numerous MSc theses, dedicating 1500 hours to teaching and academic development. My mentorship extends globally, fostering career growth and international exposure among young researchers and supporting initiatives like the Global Women Network for the Energy Transition.

Additionally, I contribute to scientific management, serving in roles for the International Society for Industrial Ecology, ICTA, and UAB. My expertise is recognized in my capacity as a proposal reviewer for esteemed programs and as a guest editor for the Journal of Industrial Ecology, showcasing my comprehensive involvement in the research community.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | GONZÁLEZ ARIAS, JUDITH |
| **Referencia:** | RYC2023-043929-I |
| **Correo Electrónico:** | judith24894@gmail.com |
| **Título:** | Advancing in the biomass and waste value chain with novel circular and energy efficient thermochemical processes |

**Resumen de la Memoria:**

Judith sees herself developing the research line "Advancing in the biomass and waste value chain with novel circular and energy efficient thermochemical processes". She has some ideas like:

(1) Utilisation of membrane technology to valorise the liquid-phase coming from some thermochemical treatments. Judith has developed projects to use the solid product and the gaseous phase of many thermochemical treatments. Nevertheless, the liquid-phase resulting from these treatments is typically disregarded. This liquid-phase contains a lot of added-value chemicals, but vaporisation has a high energy penalty that makes unaffordable its recovery. Judith proposes the use of membrane technology (i.e., membrane distillation, forward osmosis, reverse osmosis, etc.) as an energy-efficient way to recover this added-value products. This alternative increases the circularity of the processes and might enhance the profitability of thermochemical treatments. To carry out this study, Judith has some international links with the University of Surrey, and she can also count on experts from the University of Seville as national collaboration.

(2) Combination of thermochemical treatments and catalytic processes to produce bio-chemicals and fuels. Judith would like very much to explore the production of bio-methanol using hydrothermal carbonization of biomass/waste plus catalytic conversion of $CO_2$ and char to bio-methanol. The gaseous phase of hydrothermal carbonization is very rich in $CO_2$. On the other hand, the solid obtained is a char with high carbon content. Through reaction of these two compounds, it is possible to obtain CO via Boudouard reaction. The CO produced can later react with green hydrogen to produce bio-methanol. This alternative allows to save one molecule of $CO_2$ in comparison with the classical $CO_2$ conversion to methanol. Since the green hydrogen price is high, saving one molecule can make a difference in the economic balance of the process.

(3) Building blocks recovery via thermochemical treatments. Some wastes are very difficult to be treated since its composition is very wide and some of them can be contaminated. To this end, Judith's proposal is to recover the valuable building blocks via thermochemical treatments. In this line, Judith would like to keep exploring for examples the following points: (a) Further research and development on the optimal reaction parameters for thermochemical treatments to maximize the yield of valuable building blocks; (b) Conduct a comprehensive environmental impact assessment to evaluate the emissions, energy consumption, and overall sustainability of the process. This would require implementing any necessary modifications to minimize the environmental footprint; (c) The establishment of stringent quality control measures to ensure the purity of the obtained products. High-quality feedstock is crucial for the plastic manufacturing industry; (d) Exploration of opportunities for integrating the thermochemical treatment processes into existing waste treatment and plastic manufacturing infrastructures. This may require collaboration with waste management and plastic production facilities.

**Resumen del Currículum Vitae:**

Dr. Judith González Arias is a Postdoctoral Researcher (Juan de la Cierva) in the SURFCAT group at the University of Seville (Spain). Currently, she develops the research line "Advanced catalytic processes for improving circularity of thermochemical treatments" via valorisation of the gaseous phase, moving from disregard the stream to consider it a business opportunity. She has published 7 publications in highly reputed journals from this research. Previously she was a Postdoctoral Researcher in the Energy Technology Division at Chalmers University of Technology (Sweden) for 19 months, where she led the research line "Energy efficient thermochemical valorisation of medical waste", being PI of 2 research projects (~100 k€) in this line, and publishing 10 papers in top journals. She obtained her PhD at the University of León, obtaining the Extraordinary Award. Her doctoral research activity, granted by a pre-doctoral competitive grant, focused on energy valorisation of biomass and waste through different thermochemical and catalytic processes. During her PhD studies, she did two research placements (6 months) at the Brandenburg Technological University (Germany), publishing 6 papers and co-authoring 2 conferences. In total, Judith has more than 2 years of international experience. Judith has actively collaborated with international researchers from 9 different centres, such as The Ohio State University (USA) or Aix-Marseille University (France), resulting in 18 JCR papers published. Overall, she has published 47 papers in top scientific journals (75% Q1 of JCR), highlighting high-impact journals such as Environmental Chemistry Letters (I.F. 15.7), Resources Conservation and Recycling (I.F. 13.2) or ACS Catalysis (I.F. 12.9). She has been editor of one top scientific book with Elsevier publishing house. She is Associate Editor in Frontiers in Chemistry, and Early Career Editor in the Journal of Gas Science and Engineering. Furthermore, she has co-authored 4 International book chapters. Her work has been presented at 10 International Conferences such as FBC 2023 or EUBCE 2021. Her publications have received ~413 and 606 citations in Scopus and Scholar, with H-index 12 and 15, respectively. Her research contributions have received an average of ~100 citations per year. Regarding her contribution in teaching and as emerging research leader, she is currently supervising 1 PhD Thesis and has supervised 6 final degree/master projects. She has participated in teaching activities for 670 hours (~60% of them in master courses in English), being responsible coordinator of a 400 hours-course at Chalmers. Regarding her ability to raise funds in highly competitive public calls, she has obtained 3 projects as principal investigator, with a total funding budget of ca. 164k€. Furthermore, she has participated in a total of 9 research projects (ca. 6.8 M€). Judith has participated in multiple industrial research projects (ca. 275k€) and she is co-inventor of 1 patent (under evaluation).

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | MOMBLONA , MARÍA CRISTINA |
| **Referencia:** | RYC2023-042595-I |
| **Correo Electrónico:** | cristina.momblonarincon@gmail.com |
| **Título:** | Energía fotovoltaica de tercera generación de perovskita eficiente, estable y verde. |

**Resumen de la Memoria:**

El consumo de energía está aumentando debido a una mayor industrialización mundial y una población en continuo crecimiento. Una solución para suministrar esa cantidad de energía es el empleo de la energía solar. Las células solares fotovoltaicas, dispositivos basados en semiconductores para convertir la luz solar en energía eléctrica, ya se consideran una tecnología fundamental para suministrar energía sostenible al mundo. Las excepcionales propiedades de captación de luz de las perovskitas y su bajo coste de fabricación han generado grandes expectativas como candidatos para la próxima generación de tecnología fotovoltaica. Actualmente, las células solares de perovskita más eficientes a escala de laboratorio han alcanzado eficiencias sobrepasando la del silicio comercial. Sin embargo, el rendimiento de las mismas se degrada rápidamente en condiciones operacionales y esa estabilidad a largo plazo es a día de hoy un obstáculo para su comercialización. La línea de investigación llevada a cabo por la investigadora ha sido la de investigar y solucionar en la medida que sea posible los retos de esta tecnología. Uno de los objetivos ha sido desarrollar nuevos dispositivos fotovoltaicos capaces de generar más energía, de una manera mucho más eficiente y sostenible. Para ello, se ha profundizado en el conocimiento de los mecanismos de funcionamiento (y degradación) de las células solares de perovskita y en la mejora de la eficiencia optimizando todos los componentes del dispositivo. Otro aspecto a tener en cuenta es cómo se procesa esta nueva tecnología, marcadamente dominada por el uso de disolventes tóxicos. La investigadora ha predominado el uso de técnicas de fabricación de capas finas a vacío para la realización de un procesado de esta tecnología más verde e industrialmente compatible, ampliamente demostrando y validando esta técnica como una alternativa real para su fabricación a nivel industrial.

**Resumen del Currículum Vitae:**

Cristina Momblona realizó sus estudios de doctorado en el Instituto de Ciencia molecular (ICMOL) donde obtuve el doctorado en Nanociencia y Materiales en junio de 2018 por la Universidad de Valencia. Posteriormente, en septiembre de 2018, se trasladó a École Polytechnique Fédérale de Lausanne (EPFL), Suiza, para realizar el proyecto Bismuth-based vacuum-deposited perovskite for optoelectronic applications (ABISPERO) gracias a la beca Marie Curie Sklodowska COFUND EurotechPostdoc programme fellowship. Tras más de tres años en EPFL, en enero de 2022 se movió al Instituto de Ciencia de los Materiales (ICMUV)-Universidad de Valencia mediante un contrato CDEIGENT (Programa Gen-T, convocatoria 2021, Universidad de Valencia). En la actualidad, es investigadora Juan de la Cierva-Incorporación (convocatoria 2021) desde septiembre de 2022 en el Instituto de Nanociencia y Materiales de Aragón (INMA) de la Universidad de Zaragoza. C. Momblona es experta en energía solar (fotovoltaica/células solares) y en energía lumínica (dispositivos electroluminiscentes), tiene un índice h de 25 (WoS), 26 (scopus) (entrada 30/01/2024), un FWCI de 3.23 (scopus, 30/01/2024), es coautra de 55 artículos científicos en revistas de revisión por pares con 4270 citas totales (sin autocitas, scopus, 30/01/2024). Sus resultados han sido comunicados en más de 60 contribuciones orales/póster en congresos, webinars, seminarios y workshops y es coautora de una patente. Además, tiene un fuerte compromiso con la divulgación de la ciencia participando en actividades en colegios e institutos, en la noche de los investigadores y Expociencia (Parque científico de Valencia), entre otros. Ha codirigido dos trabajos fin de máster y en la actualidad es investigadora principal de un proyecto de la Cátedra SAMCA de nanotecnología y es co-investigadora principal de un proyecto del Plan de Generación de Conocimiento, convocatoria 2022.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | DELGADO GRACIA, MONICA |
| **Referencia:** | RYC2023-044207-I |
| **Correo Electrónico:** | monica@unizar.es |
| **Título:** | Sustainable thermal tnergy storage with phase change materials for a decarbonized society |

**Resumen de la Memoria:**

The applicant, Mónica Delgado, industrial engineer, started her research career in the research line of TES with PCM in April 2009. In that moment, the use of PCM suspended in water became more relevant, due to its fluidity and the advantages that this entailed (simpler and cheaper systems). Nevertheless there were some critical critical points to be addressed in order to carry out their integration in a more extensive way. During her doctoral studies, she made a great progress in the resolution of these difficulties, and analyzed their thermal behavior and technical feasibility in comparison to sensible TES with water and to conventional latent TES where PCM was macroencapsulated, and to traditional heat transfer fluids (HTF). In October 2013 she completed her PhD at the University of Zaragoza. During this predoctoral period, the applicant published a total of 8 publications in high impact journals. In relation to the transfer knowledge and in the line of thermal energy storage, she was participating in several contracts with relevant companies such as CIAT group and Abengoa. The work developed during the predoctoral period was awarded twice, and gave rise to continue her research with PCM slurries but this time in its use as a storage material itself, with the support of the companies Lapesa and Repsol. After the study of two prototypes, a stirred conventional tank with a low cost phase change emulsion was developed as potential thermal energy storage system for medium-temperature applications. The successful development of these solutions was partly due to the accurate and precise determination of the thermophysical and rheological properties of these PCM slurries. Her conscientious work in this regard has made the applicant an expert in this field, just as is recognized by her participation in several working groups of the International Energy Agency and leading the Laboratory of Thermal Engineering from the University of Zaragoza. During this postdoctoral period, the applicant published a total of 20 publications in high impact journals and continued transferring her knowledge to private companies in the form of contracts with companies as renowned as BSH Home Appliances, Valeo Systemes Thermiques and Samca Group. Up to that moment, the applicant's research was mainly focused on paraffinic slurries. However, given the concern from the environmental impact of paraffins, the applicant started to investigate sugar alcohols as materials with great potential to be used as PCM, both at material level and heat exchanger level. First results are being promising and a protype of stirred and seeded tank with sugar alcohols at lab-scale has been already tested, which is already in its scale-up phase to be researched under more realistic operating conditions. These investigations have recently been published in the form of 2 JCR articles. In light of her publications throughout her career, it can also be stated that the candidate's collaboration network is wide and international, as demonstrated by her publications together with 61 international researchers from 26 different research institutions. The researcher is aware of the importance of dissemination, both to a scientific public, with her constant participation in conferences, and to society, by means of activities that try to promote scientific vocations among girls.

**Resumen del Currículum Vitae:**

Mónica Delgado, an industrial engineer, is since 2018 Associate Professor at the Centro Universitario de la Defensa, belonging to the University of Zaragoza, teaching in the Degree of Industrial Organization Engineering. She began her research career in the research line of Thermal Energy Storage with phase change materials in April 2009, within the Thermal Engineering and Energy Systems Group of the Aragon Institute for Engineering Research (I3A). In October 2013 she defended her doctoral thesis "Analysis of microencapasulated phase change material slurries and phase change material emulsions as heat transfer fluid and thermal storage materials", obtaining summa cum laude. During this predoctoral period she published a total of 8 papers in high impact journals. In relation to the knowledge transfer, simultaneously to the completion of her doctoral thesis, she was participating in several contracts with relevant companies, such as CIAT group and Abengoa. The work developed during the pre-doctoral period was awarded twice; in 2013 by the Iberdrola Foundation, funding an R&D project continuation of her thesis; and in 2016, where the Eurotherm Committee awarded her doctoral thesis. These prizes are awarded every four years to researchers under 35 years of age whose doctoral thesis is in the field of thermal engineering.

During her postdoctoral period, the applicant has published a total of 20 publications in high impact journals. As in her pre-doctoral period, she has transferred her knowledge to private companies, in the form of contracts with well-known companies such as BSH Home Appliances, Valeo and Samca Group among others.

The applicant has two periods of six-years research (2014; 2020).Her scientific articles, as of January 26, have a total of 1021 citations, an h-index of 14 and an i10 index of 19, according to Scopus. During the last five years she has received an average of 111.4 citations per year. Fifty percent of her papers are in the top 25% of most cited papers and 82.4% in the top 25% of Journals.

She has participated in more than 40 national and international congresses, and has participated in 7 national public funded research projects. She has also been the principal investigator of the Campus Iberus Energy Action Group "Energy Efficiency for Smart Cities".

Her research career in the field of Thermal Energy Storage is recognized by her participation in several working groups of the International Energy Agency: 1) IEA SHC-ECES Task 42-Annex 24 and its extension Task 42-Annex 29 "Compact Thermal Energy Storage"; 2) IEA SHC Task 55 "Integrating Large SHC Systems into DHC Networks"; 3) IEA SHC-ECES Task 58-Annex 33 "Material and Components for Thermal Energy Storage"; 4) IEA SHC Task 67 "Compact Thermal Energy Storage Materials". In particular, she has been the coordinator of the working group on intercomparative viscosity tests in the framework of these IEA Tasks, organizing in this context the "1st Rheometry Workshop on PCM". In addition, she manages the Thermal Engineering laboratory of the GITSE group at the University of Zaragoza.

The applicant has completed a predoctoral stay at the Fraunhofer Institute ISE in Freiburg, Germany, and a postdoctoral stay at the Ecole Supérieure des Mines Paris-CEMEF (CNRS), France. She has supervised 17 bachelor's theses and 2 master's theses. She is currently supervising two doctoral theses.

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| **Área Temática:** | **Energía y transporte** |
| **Nombre:** | GONZÁLEZ ROSILLO, JUAN CARLOS |
| **Referencia:** | RYC2023-043274-I |
| **Correo Electrónico:** | juancarlos.gonzalez.rosillo@gmail.com |
| **Título:** | Energy Storage Technologies based on Next-Generation Solid-State Batteries |

**Resumen de la Memoria:**

I am a research scientist in ICREA Prof. Tarancon's group at the Catalonia Institute for Energy Research (IREC) working on solid-state battery technologies for energy storage. I have authored 22 peer-review publications (7 as first author, including 1 book chapter) in reputed journals (16 papers in Q1 and 10 in D1 including top-tier publications with IF>30 in Advanced Materials, Nature Energy, Nature Reviews Materials, Nature Materials) that have received 750+ citations (h-index 13) and hold 1 patent. My research has largely contributed to establishing new research lines at my working institutions, including the promotion of a large consortium between MIT and Ericsson. Overall, I consolidated a deep-technology transfer profile that includes experience in patenting and working together with world-leading companies such as Ericsson, Samsung and Horiba.

I joined IREC after being granted a MSCA-COFUND senior postdoctoral fellowship (Tecniospring Industry). This program included i) an industrial partner, Worldsensing, as the end-user of the envisioned battery technology and ii) extensive training on Commercializing Technologies, provided by the ASTP. I am also becoming the leading scientist in the operando characterization of advanced energy devices. Currently at IREC, I am work-package leader of the AfreeSSB M-ERA.NET consortium (>1M€budget) to develop anode-free high-energy-density solid-state batteries and the HE ADVAGEN consortium to develop lithium metal batteries with hybrid oxide-sulfide solid electrolytes (>8M€budget).

Before, I was a postdoctoral researcher in Prof. Jennifer Rupp's lab at MIT for 3 years. I developed unique expertise regarding the processing of Li-garnet solid-electrolyte films for solid-state batteries, including working on an industrial project with Samsung. These experiences reflected in the publication of a high-impact review entitled "Processing thin but robust electrolytes for solid-state batteries" in Nature Energy.

For my PhD at ICMAB-CSIC with Prof. Teresa Puig and Dr. Anna Palau, I was granted a FPI fellowship that allowed me to explore the memristive behavior of perovskite oxides relevant to the energy field. I started new collaborations with top scientists, becoming visiting researcher at UniGe (CH) and at FZ Jülich (DE).

For my near future research career, I will choose challenging topics that will allow me to generate disruptive concepts based on my existing knowledge and expertise on energy storage. In particular, I will develop a line of research focusing on 1) next-generation solid-state electrolytes, and 2) their electrochemical interfacial compatibility with other battery components – cathodes and anodes, including Li-metal:
- Development of new solid-electrolytes for ultra-high density solid-state batteries.
- Large-scale affordable methods for reliable manufacturing of robust solid-state electrolytes.
- Materials for artificial SEI and interfacial compatibility,
- Bipolar multistacking of solid-state batteries for high-voltage, high-capacity applications.
- Solid-electrolytes for post-Li era (Li-O2, Li-air batteries, Na-air batteries).
- Big data operando characterization of solid-state batteries and their interfaces by non-invasive optical techniques.
- Disruptive and emerging technologies enabled by solid-state electrolytes, such as sensors, transistors and electrochromic devices

**Resumen del Currículum Vitae:**

I am a research scientist in ICREA Prof. Tarancon's group at the Catalonia Institute for Energy Research (IREC) working on solid-state battery technologies for energy storage. I have authored 22 peer-review publications (7 as first author, including 1 book chapter) in reputed journals (16 papers in Q1 and 10 in D1 including top-tier publications with IF>30 in Advanced Materials, Nature Energy, Nature Reviews Materials, Nature Materials) that have received 750+ citations (h-index 13) and hold 1 patent. My research has largely contributed to establishing new research lines at my working institutions, including the promotion of a large consortium between MIT and Ericsson. Overall, I consolidated a deep-technology transfer profile that includes experience in patenting and working together with world-leading companies such as Ericsson, Samsung and Horiba.

I am co-author of 28 contributions to international and national conferences (4 invited talks, 21 oral and 3 posters). I have participated of 13 outreach activities (BCN Science Fest, European Researcher's Night, Saló de l'Ensenyament, Dia de la Ciència a les Escoles, BIYSC La Pedrera) being awarded the 3rd prize in the contest of scientific stand-up organized by the FCRi. I am also the coordinator of outreach activites of the group (35+ researchers). Regarding organization of events, I co-organized the Memory Devices symposium at the International Conference of Electroceramics (ICE 2019) and the 1st Scientific Meeting of BNC-b Students (JPHD2013). I am reviewer for 15+ journals (60 reviews) and contributed to early-stage research careers with the supervision 1 master and 1 undergrad students at MIT and currently 2 PhD students and 2 postdocs on solid-state batteries.

I joined IREC after being granted a MSCA-COFUND senior postdoctoral fellowship (Tecniospring Industry). This program included i) an industrial partner, Worldsensing, as the end-user of the envisioned battery technology and ii) extensive training on Commercializing Technologies, provided by the Association of European Science and Technology Transfer Professionals. I am also becoming the leading scientist in the operando characterization of advanced energy devices. Notably, I am playing a crucial role in pioneering the commercial development of sample holders for in-situ electrochemical Tip-Enhanced Raman Spectroscopy in collaboration with Horiba.

Before, I was a postdoctoral researcher in Prof. Jennifer Rupp's lab at MIT for 3 years. I developed unique expertise regarding the processing of Li-garnet solid-electrolyte films for solid-state batteries, including working on an industrial project with Samsung. These experiences are reflected in the publication of a high-impact review entitled "Processing thin but robust electrolytes for solid-state batteries" in Nature Energy. I also designed Lithium

ion-based memristors for low-power consumption computing. The discovery of this effect was published in Advanced Materials (IF > 30) and a US/WO patent was filed. A direct consequence of my work is the establishment of a research consortium between MIT and Ericsson to develop Li-based neural networks. A second high-impact review entitled "Lithium-film ceramics for solid-state lithionic devices" was published in Nature Review Materials (IF>66, 2nd author), highlighting the rising opportunities in microelectronics of battery materials.

**Resumen de la Memoria:**

My PhD thesis was entitled ' Beyond vegetation and plant-food production, exploring wood gathering strategies, crop husbandry and plant use at early Pre-Pottery Neolithic Tell Qarassa North (south Syria)' . The work aimed to determine plant exploitation practices just before the development of agriculture in southwest Asia (c. 10.7-10.2 ka cal. BP). During this time I developed an expertise in two separate disciplines (wood charcoal and non-woody plant remain analyses), and sought to move beyond traditional taxonomic analyses by integrating cutting-edge taphonomic approaches. This novel approach allowed me to reconstruct past vegetation and subsistence practices comprehensively, and tackle a number of key research themes such as plant domestication and the origins of agriculture; early Holocene vegetation changes and the impact of climate and human activities in the landscape; and early Neolithic plant exploitation and husbandry activities.

My postdoctoral research instead focused on study of plant exploitation among Natufian hunter-gatherers in Jordan and early Neolithic communities in Iran. During this time period, I specialized on study of less common plant remains such as tubers/rhizomes and charred food remains, and I was able to address new research themes such as the origins of bread; the prehistoric exploitation and consumption of root foods; the origins of agriculture in the Zagros area; the biases related to the concept of the " Founder Crops" ; and the foodways of the last hunter-gatherers and first farmers in southwest Asia.

My future career will feature three major additional lines of research:

1) The Epipalaeolithic origins of plant management in southwest Asia. I will fill a major gap in our knowledge about the transition from foraging to farming. I will move beyond traditional Neolithic-centred narratives, and evaluate the role that Epipalaeolithic communities played into this crucial process. I will ask: To what extent were Epipalaeolithic hunter-gatherers managing the land and the plant resources around them? Did climatic factors trigger plant resource intensification? or did cultural dynamics, like the need for specific foodstuffs, first motivated plant-food production? Merging science and theory I will elucidate the nature of the human-environment interactions that paved the way to agriculture, and ultimately, changed the course of our history.

2)Characterising Medieval Appetites. I will also shed new light on the plant-based foodways of the medieval ages in the Iberian Peninsula (VI-XIth century). I will differences in the culinary traditions of Muslim, Christian and Jews that inhabited the region, focusing on one of the most revolutionary forms of the material culture: the accidentally carbonized remains of prepared plant-food meals.

3) Origin and spread of Neolithic cooking traditions. The ultimate aim is to uncover the culinary traditions that emerged and spread during the Neolithisation process, right from its origin in southwest Asia to its final spread into Europe. We will provide first-hand revolutionary evidence on the intangible cooking traditions that made possible the spread of specific crop and animal ingredients, and associated cooking technologies. This work will allow us uncovering the origins of cereal-based meals (e.g. bread), the production of dairy products and alcoholic beverages, among others.

**Resumen del Currículum Vitae:**

Her research has primarily contributed to the understanding of the plant-based subsistence of the last hunter-gatherers and first farmers in southwest Asia. Through the application of archaeobotany, ethnoarchaeology and experimental archaeology she tackled a number of research themes, contributing new ideas and hypothesis such as: i) that the origins of bread pre-dated the advent of agriculture for at least 4,000 years, and could have triggered the development of food production; ii) that regional differences existed in the development of cereal cultivation and domestication in southwest Asia; iii) that the concept Neolithic ' Founder Crops' represents a modern construction. Methodologically, she showed that carbonised remains of prepared plant-based meals can be preserved at pre-agricultural sites, and this has opened new lines of research and enquiry into the evolution of human diets and food cultures. Her research has been featured in a total of 44 papers (30 international peer-reviewed papers -16 Q1 and 4 Q2-, 11 papers in national journals, 3 book chapters, + 2 submitted chapters), and 28 regular and 10 invited National and International Conference papers in France, Germany, Canada, Italy, Spain, Denmark, Switzerland, UK and Jordan.

Obtained a Marie Sklodowska-Curie grant (2018), Juan de la Cierva Incorporación (2019), ERC Starting Grant (2021) and is beneficiary in an ERC Advance Grant (2021). Awarded 12 additional research, travelling and scientific language training grants totalling over 90,000 euros. Participated as work package leader of archaeobotanical research in 4 international projects, and collaborated in 10 national and 1 international research projects as expert in archaeobotany. Spent 6 years and 7 months working abroad (postdoc) and conducted several additional research stays, primarily at the Univ. College London (c. 5 months in total).

Expert in the analyses of the broad range of plant macroremains (wood charcoal, non-woody plants such as seeds, underground storage organs, food remains and animal dung). The scientific methods and approaches commonly used include: taxonomy, taphonomy, ethnoarchaeology, experimental archaeology, tissue-based SEM analyses, statistical analyses and illustration. Relevant experience in project management, organization of scientific meetings, science communication and outreach.

Director of archaeobotanical work in 17 archaeological sites in Spain, Jordan, Syria, Lebanon, Iran and Israel. Director (2), co-director (1), and group-member (1) of ethnoarchaeology expeditions in Iran, Jordan, Syria and Spain. Since 2016, co-director and deputy director of the archaeological site of Shubayqa 6 (Jordan). Responsible for the archaeobotanical research facility at the Dept. of Cross-Cultural and Regional Studies (Univ. Copenhagen). Currently in charge of the plant macroremain analyses at the Lab. of Palaeobotany Lydia Zapata (UPV-EHU). Invited Board Member of the Textile Lab (Univ. of Copenhagen) and Jakiunde Academy (Basque Country).

Dissemination activities including radio, journal interviews, public talks, school activities and TV. Invited 18 times to deliver dissemination talks at Workshops and Research seminars in world leading Museums (e.g. MNHN) and Universities (e.g. North Caroline, Reading, Basel, Durham, Copenhagen). Published a dissemination booklet (serie Origen Fundación Atapuerca).

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | BARAHONA MENDIETA, ZULEMA |
| **Referencia:** | RYC2023-044528-I |
| **Correo Electrónico:** | zulemabara@hotmail.com |
| **Título:** | La cerámica como documento histórico del Antiguo Egipto |

**Resumen de la Memoria:**

Mi formación en arqueología (Universidad de Alicante 2005) y mi especialización en egiptología (Master y tesis doctoral con premio extraordinario en la Universidad Autónoma de Barcelona 2016 y contrato postdoctoral en la Universidad de Basilea (Suiza) 2016-2019) así como mis estancias de investigación en el extranjero y mi especialización en cerámica egipcia (IFAO, CeAlex, CNRS, Museo del Louvre, Universidad de Milán). Me han permitido convertirme en una de las principales especialistas en cerámica egipcia de España y con un horizonte cronológico más amplio de Europa (Reino Antiguo – Época Bizantina). Esta formación se ha visto acompañada por una intensa experiencia profesional sobre el terreno (participación como arqueóloga y ceramóloga en más de 20 misiones arqueológicas en España, Italia y principalmente en Egipto). En la actualidad formo parte de varios proyectos de investigación con financiación española e internacional y soy IP de dos proyectos internacionales de investigación financiados por el Institut français d'archéologie orientale du Caire y el Centre d'études Alexandrines (CNRS). Esta experiencia me ha permitido desarrollar una intensa actividad investigadora que se ha reflejado en 26 artículos con comité de revisión, capítulos de libros y participación en coloquios y congresos internacionales. Desde el 2020 soy investigadora asociada en la Universidad de la Sorbonne y desde el 2022 he podido compartir mi experiencia internacional en el marco universitario gracias a un contrato de atracción de talento internacional María Zambrano en la UAB. Mi línea de investigación de carácter multidisciplinar enfocada en la cerámica egipcia como documento histórico, económico, técnico y social se viene ya desarrollando en mis dos proyectos de investigación "Ceramiques thebaines" y "Arts du feu" en el marco de los cuales he podido ya organizar un primer coloquio internacional en 2022. En ella se avanza en cuestiones de producción cerámica en el Antiguo Egipto con el fin de conocer los puntos de fabricación de tipologías de especial importancia y los puntos de consumo con el fin de trazar redes de comercio e inferir conclusiones de carácter económico y comercial, ámbitos que hasta el presente no se han tratado nunca en egiptología con datos arqueológicos. Al mismo tiempo se avanza en cuestiones técnicas de fabricación cerámica acercándonos a las reconstrucciones de la Chaines Operatoires en periodos de especial importancia histórica que implican procesos de industrialización de la artesanía. Gracias a mi trabajo como ceramóloga en uno de los mayores centros de producción cerámica de Egipto y del Mediterráneo oriental, Medamud, y a la aplicación de diferentes y novedosas técnicas de investigación, en colaboración con otros especialistas (Análisis mineralógicos, análisis de huellas dactilares, radiografías etc.) esta línea de investigación posibilita la obtención de novedosos y abundantes datos y nos acercan a nuevas respuestas para cuestiones históricas, técnicas y sociales de gran calado.

**Resumen del Currículum Vitae:**

Soy investigadora postdoctoral en la UAB gracias a la obtención del contrato de atracción de talento internacional del programa de excelencia María Zambrano como especialista en cerámica del Antiguo Egipto e investigadora asociada en la Sorbonne University in Paris (Mondes pharaoniques, UMR 8167). He desarrollado la mayor parte de mi carrera investigadora entre España, Francia y Egipto. En 2016 obtuve el doctorado en egiptología (con mención europea) en la Universidad Autónoma de Barcelona con la tesis doctoral "Contribución a la historia de Medamud: estudio y caracterización diacrónica de la cerámica descubierta durante las excavaciones del IFAO entre 1925 y 1939" que fue premiada con el premio extraordinario de doctorado de dicha universidad. Parte de esta investigación ha sido publicada en mi primer libro "Medamud, un centro de producción cerámica en el Alto Egipto. Estudio de los materiales cerámicos recuperados en las excavaciones del IFAO en el yacimiento entre 1925 y 1939" en la principal editorial académica española especializada en egiptología (Aula ÆGYPTIACA – STVDIA (AÆ-S). La segunda parte de mi investigación (ya aceptada por el comité de edición) será publicada en un número especial en la prestigiosa colección especializada en cerámica egipcia Cahiers de la Céramique Egyptienne publicado por el IFAO (Egipto).En 2016 obtuve un contrato de investigación postdoctotal en la Universidad de Basilea, siendo así investigadora del proyecto "Life Histories of Theban Tombs" financiado con 2,621,445 CHF por la Swiss National Science Fundation. Desde el 2019 codirijo el proyecto de investigación "Les céramiques thébaines: échanges et réseaux économiques" en el IFAO y cuyos resultados concernientes a los centros de producción cerámica, han supuesto ya aportes reflejados en varios coloquios internacionales y publicaciones. Desde el 2022 codirijo además un programa de investigación en el IFAO en colaboración con el CeAlex ("Arts du feu : six millénaires d'artisanat du feu en Égypte") y dentro del cual he organizado un coloquio internacional en 2022. Desde el 2012 he participado como investigadora en más de 10 proyectos de investigación financiados tanto por instituciones nacionales (Ministerio de cultura, Ministerio de Ciencia en Innovación, Agaur) como internacionales (IFAO, ERC, CNRS, etc.) y actualmente participo activamente en 5 proyectos de investigación. Entre mis publicaciones científicas se encuentran capítulos de libro recogidos en algunas de las monografías dedicadas a la arqueología egipcia y la cultura material con un planteamiento más innovador, como han sido "Life Histories of Theban Tombs: Transdisciplinary Investigations of a Cluster of Rock-cut Tombs at Sheikh 'Abd Al-Qurna" (2021), publicado en una de las más importantes editoriales en egiptología, la AmeAmerican University in Cairo Press, y "La présence grecque dans la vallée de Thèbes", publicado por Presses universitaires de Rennes. He podido así mismo publicar hasta el momento 26 artículos in peer reviewed revistas científicas especializadas, tanto en arqueología como entre las que destacan el JAS, JARCE, BIFAO, BCE, CEE, BAEFE y TrabEg así como en actas de congresos y coloquios internacionales entre los que destaca el congreso internacional de Egiptologos (en 2019 y 2023). Mi ultimo artículo, en el cual soy primera autora, ha sido publicado en la una de las revistas más importantes en arqueología Journal of Archaeological Science: Reports (SJR Q1; H-index 38).

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | MEDINA ALCAIDE, MARIÁNGELES |
| **Referencia:** | RYC2023-045481-I |
| **Correo Electrónico:** | m.medina.alcaide@gmail.com |
| **Título:** | Holistic study of the inner archaeological context of caves with Palaeolithic Art: the combustion and lighting residues as the main proxies for an interdisciplinar approach. |

## Resumen de la Memoria:

My main line of research is the holistic study of caves with Paleolithic Art. With this background, my research focuses on the interdisciplinary study of combustion/lighting remains (especially charcoal and soot) to reach a comprehensive understanding of the use and the frequentation of caves throughout (Pre)History. The main methodologies that I use to analyze combustion residues are Anthracology, Bayesian analysis, and GIS Analysis, among other elemental and microscopic analyses (Raman spectroscopy and TEM-EDX), preferably onsite analysis and without sampling. My collaboration in research projects began during my degree in History at the UCO (2008-2012). In this period, my participation in the Nerja Cave Research Project and obtaining my Final Degree Award stand out. I started the third cycle of studies with a Research Master's in Quaternary Archeology at the UPV/EHU (2012-2013). There I had the opportunity to train in the study of charcoal in the archaeological record, thanks to the training received from L. Zapata. My marks in this Master were outstanding, and I obtained a Final Master's Award. During my Ph.D., I carried out teaching practices at the UPV/EHU and UCO, in the latter as a collaborating researcher and as member of HUM-789 research team. Besides, I obtained the Extraordinary Doctorate Prize by UPV/EHU. In the North of the Iberian Peninsula and France, I have participated in various competitive national and international research projects, usually under the direction of D. Garate and O. Rivero. In Andalusia (Spain), I lead a new interdisciplinary research team for the study and revaluation of Paleolithic caves in this region (in progress research in Los Márquez and Navarro caves). In the Basque Country, I currently direct the holistic re-study of the Altxerri cave (UNESCO cave), and collaborate in numerous caves with Palaeolithic art. Since 2021, I work in PACEA laboratory (UBx, France), thanks to Fyssen postdoctoral grant (2021) and a prestigious MSCActions postdoctoral contract (2022-2024). In this framework, my international network has grown enormously, and I am currently collaborating in several projects of outstanding European Palaeolithic caves, such as Bruniquel, Cussac, Cosquer, La Mouthe, Fontanet... Moreover, I collaborate with E. Pons-Branchu (LSCE, France) on carbonate dating in Paleolithic caves, with S. Vandevelde in interdisciplinary analysis of the prehistoric soot (UVQ, Canada), with K. Steelman (Shulman, USA) in radiodating of tiny samples of charcoals, etc.

As a renowned international Ph.D in Prehistory, I am advancing the scientific understanding of Prehistory in new and exciting ways. Recognized by peers and institutions, I have made three key contributions to this vital field: 1) I have contributed to the generalization of a holistic approach in the study of European caves with Parietal Palaeolithic Art, exploring all aspects of the sites, not just the artwork. 2) I have established a pioneering line of research on the interdisciplinary study of combustion in these subterranean sites. 3) I have rekindled interest in the study of decorated caves in the south of the Iberian Peninsula using cutting-edge and interdisciplinary methods that promise to uncover new insights into the past.

## Resumen del Currículum Vitae:

I was awarded an International Ph.D. in Prehistory by the UPV/EHU (2020), with Extraordinary Doctorate Prize, under the direction of J.L. Sanchidrián and A. Arrizabalaga (until 2015, L. Zapata and J.L. Sanchidrián). To carry out my doctorate, I obtained the FPU predoc. contract funded by the Spanish government (2014-2018). My research focuses on the interdisciplinary study of combustion/lighting remains (especially charcoal and soot) to reach a comprehensive understanding of the use and the frequentation of caves throughout (Pre)History. My collaboration in research projects began during my degree in History at the UCO (2008-2012). I did a Master's degree in quaternary at the UPV/EHU in 2012-2013 and I studied for my doctorate at the same university. Between 2020-2021, I had two research contracts at the University of Cordoba and the University of Cantabrian (Spain) inside national competitive projects. Since 2021, I work in PACEA laboratory (UBx, France), in 2021 with the Fyssen postdoctoral grant, and between 2022-2024 thanks to a prestigious MSCA postdoctoral contract.

Since 2010, my prolific academic journey has led to 156 scientific contributions, with 73 as first author. This includes 63 articles in prestigious peer-reviewed journals (19 Q1), 32 book chapters, 3 co-authored monographs, 7 scientific reports directed for public administration, and 61 oral presentations (35 international congresses, 10 national congresses and 16 invited lectures in seminaries or similar), showing my cutting-edge research to a global audience. Today, I have 581 citations in Google Scholar and h-i10 of 18.

I have successfully secured a significant funding of 423107€ as principal investigator for my cutting-edge research, including prestigious grants like: A) Marie Skłodowska-Curie Actions PF. B) FYSSEN Postdoc. Grant. C) FPU Predoc. (for more information see section 4 of Memory). This includes competitive grants for the study of caves, awarded by public institutions and universities (as Basque Country Governement and University of Bordeaux). Some of these contracts or grants have a success rate of less than 15%. I also got the "JdC-F" and a position of Assistant professor at the University of Almeria. I turned down these last contracts in order to strengthen my international network (through my MSCA project) and to comply with the requirements for research experience abroad of some consolidation Spanish programs. The award of the Ramón & Cajal grant this year will allow me to continue my research career and return to my home country after finishing 3 years of stay abroad.

As regard Ph.D students training, I aim to be a dedicated mentor, constantly striving to cultivate the next generation of scientists. I am co-directing two Ph.D theses of Ms. E. Rodríguez (UCO), with a competitive FPU predoctoral contract, of Ms. P. García-Encabo (UC) about Altamira cave and directing a master's thesis of Ms. G. Rousseau (UBx). My engagement extends to lecturing in the Master Bio-Géosciences of UBx (2022, 17h., 15h 2023). Finally, I would like to highlight that I have recently obtained the prestigious Prix Paleon-Archéo 2024 awarded by Fondation Fyssen by my "Archaeology of Light" project.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | ESCRIBANO ROCA, RODRIGO |
| **Referencia:** | RYC2023-044990-I |
| **Correo Electrónico:** | rodrigo.escribano@uai.cl |
| **Título:** | Strategic culture and transatlantic imaginaries in Spain and Great Britain (1824-1868) |

**Resumen de la Memoria:**

I am currently consolidating my position as an internationally recognised researcher in the field of the intellectual and geopolitical history of the nineteenth-century Atlantic world, particularly concerning the imaginaries and ideological discourses that shaped the relations of Spain and the United Kingdom with the republics of the Americas in the period from 1824 to 1868. The line of research to be carried out during the contract Ramón y Cajal period will take the form of the project Navalism, pan-Hispanism and strategic culture in Spain. The Spanish-South American war and its origins (1833-1871). This proposal aims to continue and deepen the research project I am currently directing. It aims to continue studying the relationship between the Pacific Squadron and the visions of global power cultivated by Spain's political cultures. I will analyse the geopolitical ideas and representations that motivated the planning of the enterprise by the ministries of the Liberal Union between 1858 and 1862. To this end, it will be necessary to go back to how, in parallel with the consolidation of the liberal state (1833-1858), the different ideological tendencies of Elizabethan Spain imagined the link between the geostrategic regeneration of the Monarchy, the establishment of a sphere of influence in the Spanish-American republics, and the utilisation of the navy as an instrument of global power. The main question that will form the backbone of the research will be how the organisation of the Pacific Squadron and the subsequent Spanish-South American war were related to the ideological phenomena of Navalism and pan-Hispanism. We question to what extent the war with Chile and Peru was a spontaneous neo-colonial adventure. We explore to what extent it was congruent with the strategic culture of the liberal elites.

**Resumen del Currículum Vitae:**

In October 2019, thanks to the FPU14/04695 Doctoral Fellowship, I passed the exams for the award of the PhD degrees at the University of Alcalá and Western Sydney University. Since March 2020, I have worked as a contracted lecturer and researcher at the Universidad Adolfo Ibáñez de Chile. I am also a researcher at the University Institute for Research in Latin American Studies of the University of Alcalá. In October 2020, I was awarded by the National Agency for Research and Development of Chile with the Fondecyt Initiation Project No.11200245, entitled "The Pacific Expedition and the Spanish-South American War in the geopolitical imaginaries of liberal Spain (1860-1866)" and funded with 54,542€ In January 2024, I was awarded by the National Agency for Research and Development of Chile with the Fondecyt Project No.11200245, entitled "The Pacific Expedition and the Spanish-South American War in the geopolitical imaginaries of liberal Spain (1860-1866)" and funded with 24,000€ I have also been a researcher in 4 international and 3 national research projects related with transatlantic political imaginaries.

Since 2016 I have been the author of 10 WoS articles, 13 Scopus, 4 ERIH+ and 3 Latindex articles. I have also authored 1 book (Marcial Pons), edited 1 book (Altazor) and authored 12 book chapters. I have participated as a speaker in 60 scientific meetings. In 2021 I received three awards for my research work: the Best Young Researcher Award of the Faculty of Liberal Arts of the University Adolfo Ibáñez, the Extraordinary Thesis Award from the University of Alcalá and the Research Award from the Society of Condueños of the City of Alcalá. I have obtained 5 mobility fellowships, 3 predoctoral research fellowships, 1 doctoral research fellowship and 1 postdoctoral research fellowship.

The international scope of my trajectory is a consequence of my research's transnational and comparative nature. It is also due to my time as a visiting researcher at institutions such as the Center of Iberian and Latin American Studies at the University of California, San Diego or the Center of Political Science of the Universidad Nacional de San Marcos and for my period as a student and lecturer at other international institutions, such as the School of Humanities and Communication Arts at Western Sydney University, the Pontificia Universidad Católica de Chile or the Universidad Adolfo Ibáñez itself. Such internationalisation also derives from my inclusion in other networks and associations, such as the Hispanic Anglosphere and the Society for Global Nineteenth-Century Studies. Thanks to my institutional work in the creation and promotion of international research networks, I received the Award for the Promotion of Internationalisation from the Faculty of Liberal Arts of the Universidad Adolfo Ibáñez in January 2023.

My teaching and outreach work has deepened and demonstrated my research skills. I have imparted more than 1.500 accredited teaching hours at the University Adolfo Ibáñez, the University of the Americas and the University of Alcalá. I have been able to use my research's contents and theoretical-methodological frameworks in class, becoming the principal researcher of two projects to train undergraduate students in research. I have successfully tutorised 4 Master's degree theses and 1 doctoral thesis at the University Institute for Research in Latin American Studies of the University of Alcalá.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | RODULFO HAZEN, IGNACIO |
| **Referencia:** | RYC2023-044579-I |
| **Correo Electrónico:** | ignaciorodulfo@gmail.com |
| **Título:** | La mundialización de la cultura hispánica en las capitales virreinales de la Monarquía Católica. Entre el Mediterráneo y el Atlántico (1580-1640) |

**Resumen de la Memoria:**

Durante mis estudios previos y posteriores al doctorado he emprendido tres líneas fundamentales de investigación:

-Los usos musicales y teatrales en el mundo hispánico entre los siglos XVI y XVII. Este campo de estudios, que era inédito en la historia moderna, se ha consolidado mediante las actividades de difusión y las publicaciones como una línea sobre la que hoy trabajan otros estudiosos del departamento de Historia Moderna de la Universidad Complutense.

-La recuperación del estudio de las generaciones en la historia social española. Olvidado durante décadas, he retomado el estudio de las generaciones que emprendió la Escuela de Madrid en la primera parte del siglo XX, con un punto de vista que se ha extendido a otros estudiosos de varios departamentos humanísticos de la Universidad Complutense, con quienes organizaré un seminario dedicado el tema.

-El estudio de las comunidades españolas fuera de España en la Edad Moderna. Este estudio centrado en el caso de los barrios españoles de Roma y Nápoles ha coincidido con los intereses de otros estudiosos. Fruto de esta convergencia estoy coordinando el próximo número monográfico de la revista Pedralbes, de la Universidad de Barcelona, dedicado enteramente a esta cuestión.

Una vez constatadas las posibilidades del estudio influjo de la cultura hispánica del Siglo de Oro a través de los libros, las músicas, los saberes y las formas de vida, se propone su ampliación a un ámbito más amplio tanto social (de la aristocracia a las comunidades más amplias de españoles fuera de España) y geográfica (en el viejo y el Nuevo mundo):

LA MUNDIALIZACIÓN DE LA CULTURA HISPÁNICA EN LAS CAPITALES VIRREINALES DE LA MONARQUÍA CATÓLICA. ENTRE EL ATLÁNTICO Y EL MEDITERRÁNEO (1580-1640).

Sobre la base de los estudios de la Monarquía Hispánica, la historia de la cultura, la mundialización y la noción recientemente acuñada de la hispanofilia, se trata de estudiar cómo los soldados, los comerciantes, los religiosos, pero también las mujeres que los acompañaron, y otras gentes «menudas», como los servidores o los esclavos, contribuyeron con sus vidas itinerantes, por distintos territorios de la Monarquía, a la primera extensión de costumbres, músicas, libros, saberes en lengua española a los dos lados del Atlántico durante la época de la unión ibérica. Se trata, por tanto, de extender el estudio de la mundialización en Europa y América a un ámbito social más amplio que el de los dignatarios y lugartenientes de los Habsburgo españoles, que ya he estudiado, trazando las conexiones y las diferencias que hubo en los dos grandes vectores de la Monarquía: hacia el Mediterráneo y hacia el Atlántico. Las fuentes principales serán los archivos notariales y eclesiásticos de cinco grandes capitales virreinales: Nápoles, Palermo, México, Lima y Lisboa. Creo que estos estudios reservan hallazgos prometedores no sólo para la historia de la cultura, sino también para la historia de la Monarquía Católica, que se perfila no sólo como una unión dinástica y estructura de oligarquías de gobierno, sino como un mundo de vínculos sociales y formas de vida compartidas.

**Resumen del Currículum Vitae:**

Ignacio Rodulfo Hazen (Madrid, 1992) es doctor europeo en Historia Moderna, acreditado a profesor ayudante doctor por la ANECA. Es contratado postdoctoral "Margarita Salas" en la Universidad Complutense de Madrid, con estancia en la Università degli Studi di Napoli Federico II. Ha obtenido un contrato predoctoral FPU (14/04366), una beca de colaboración de la UCM, dos becas de excelencia de la Comunidad de Madrid (2011-2012 y 2013-2014), el premio extraordinario fin de carrera del grado de Historia (2014) y el premio extraordinario de doctorado (2022). Es autor de una monografía científica, diez artículos académicos (siete de ellos en revistas de alto impacto, seis de ellas extranjeras) y cuatro capítulos de libro (dos de cuyas editoriales están en el primer cuartil del SPI, dos de ellas extranjeras). Ha impartido 118 horas de docencia durante su etapa doctoral y al presente imparte la asignatura de Historia cultural de la Edad Moderna en la Universidad Complutense de Madrid. Ha participado en cuatro proyectos competitivos i+d y es miembro de un grupo de investigación de la Universidad Complutense de Madrid calificado como excelente (97). Ha organizado tres seminarios científicos y un taller doctoral y coordina el aula internacional del Siglo de Oro, organizada por «Festival Iberoamericano de la Comunidad de Madrid. Clásicos en Alcalá».

Ha realizado dos estancias de investigación financiadas, en la Universidad Federico II de Nápoles (2 años) y en La Sapienza de Roma (3 meses) y ha sido investigador invitado en la Universidad L'Orientale de Nápoles (3 meses). Ha impartido clases como profesor invitado en la Universidad Federico II de Nápoles, en el Departamento de Historia del Patrimonio Cultural, el Departamento de Ciencias Históricas y el Departamento de Lenguas, Culturas y Literaturas europeas modernas. Ha participado en seminarios y cursos de varias instituciones extranjeras. Prepara un libro editado por la Universidad L'Orientale de Nápoles junto a Giuseppe Porzio y Luigi Abbetti, que se publicará en 2024.

Al mismo tiempo lleva a cabo una labor de transferencia del conocimiento y gestión cultural como actor y codirector musical en la productora y compañía de teatro For the Fun of It, y como secretario en la Asociación para la Libertad y las Artes Príncipe Baltasar Carlos. Desde 2019 es patrono asesor del Teatro Real. Ha publicado cuatro artículos en prensa nacional, y ha participado en varios programas de radio divulgando sus estudios. Ha grabado un CD editado por Warner Classics y ha preparado las notas a otro editado por Brilliant Classics. Ha sido codirector musical de "La Crítica del Amor", coautor del espectáculo "Oro y Plata de Ramón", que ha sido nominada a un premio Max por autoría revelación, de "Más acá de los Romances", y "Don Juan desde don Juan".

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
| **Nombre:** | CONESA NAVARRO, PEDRO DAVID |
| **Referencia:** | RYC2023-045876-I |
| **Correo Electrónico:** | pedrodavid.conesa@um.es |
| **Título:** | Littera et Imago: Julia Mamaea, Julia Soaemias y Julia Mamaea en la política imperial. Un estudio multidisciplinar de las mujeres de la corte de Heliogábalo y Alejandro Severo |

**Resumen de la Memoria:**

Mi trayectoria investigadora se caracteriza por una gran internacionalización, además de un constante equilibro con parcelas relacionadas con la enseñanza y constante formación. Mis linas de investigación prioritarias se han centrado en la iconografía romana, tanto monetal como retratística, así como en la Historia de las mujeres y la historia política de la dinastía de los severos. Fruto de dicho esfuerzo se ha visto materializado en la edición hasta la fecha de 5 monografías publicadas en editoriales nacionales (CEPOAT, Murcia) y extranjeras (Archaopress: Oxford), a lo que se sumaría una sexta en proceso de elaboración con los Dres. J. M. Noguera e I. Rodà (UM). Cuento con 21 artículos en revistas nacionales e internacionales (Italia, Brasil, Francia, Polonia y Rumanía) tales como Rivista Storica dell¿Antichità (A&HCI, WOS (JCR): Q3 History 2022; Imafronte (WOS- JCR Q4 Art); Boletín de Arte – UMA (WOS (JCR): Q4 Art, 2022), Studia historica. Historia Antigua (WOS (JCR): Q2 History 2019), Arenal (WOS (JCR): Q2 History 2020), Athenaeum (A&HCI, WOS (JCR): Q3 2017 Classics); Latomus (A&HCI, WOS (JCR): Q3 Classics); Lucentum (WOS (JCR): Q4 Archaeology), Athenaeum (A&HCI, SJR: Q2 Classics 2016); Graeco Latina Brunensia (SJR: Q1 Classics 2020), Studia Antiqua et Archeologica (SJR: Q2 Classics 2020), Historia i &#346;wiat (SJR: Q3 History 2021), Dialogues d' Histoire Ancienne (SJR: Q4 Classics 2019), Revue des Études Anciennes (SJR: Q2, Classics 2015), Romanitas (CIR-C, Ciencias Sociales), Minius (CIRC: D, Ciencias Sociales), Alberca (CIRC: D, Ciencias Sociales), Yakka, Antigüedad y Cristianismo y Potestas (CIRC: B Ciencias Sociales), además de 17 capítulos publicados en reconocidas editoriales (Archaeopress (SPI 2022: 24 internacional), Aranzadi (SPI 2022: 34 internacional), Bloomsbury (SPI 2022: 26 internacional), Oxbow Books (SPI 2018: 34 internacional), Beçancon Franche - Compte (SPI 2018: 88 internacional), Tirant Humanidades (SPI 2018: 1ª española), Ediciones Trea (SPI 2018: 20 española; 2022: 22 internacional); Ediciones UMU (SPI 2018: 53 española), Comares (SPI 2018: 11 ed. Nacional). Amdemás, me me preocupado por las actividades relacionadas con la transferencia a la sociedad a partir de dos trabajos en revistas de divulgación, la participación en grupos de innovación docente (U. Oviedo y UCM ambos en activo) y en las charlas a centros de educación secundaria o instituciones sin ánimo de lucro. He participado de manera consecutiva en dos proyectos del plan nacional, lo que me ha permitido profundizar en mis campos de investigación y se ha visto materializado en la publicación de resultados en revistas y capítulos de alto impacto como se ha puesto de manifiesto con anterioridad. Mi carrera científica hasta la fecha destaca por un alto nivel de internacionalización e independencia académica, lo que me ha permitido construir una sólida red internacional y nacional, además de un óptimo nivel de publicaciones de impacto.

**Resumen del Currículum Vitae:**

Licenciado en Historia (2006-2011) por la Universidad de Murcia con premio extraordinario de licenciatura, realicé el Máster Interuniversitario en Historia y Ciencias de la Antigüedad (2012) en las universidades Complutense y Autónoma de Madrid y el Máster en Formación del Profesorado de Educación Secundaria (2013) en la Universidad de Murcia. Soy Doctor en Historia (2020) por la Universidad de Murcia y la Universidad Tor Vergata de Roma. Disfrutó de un contrato predoctoral por parte de la Fundación Séneca. Agencia de Ciencia y Tecnología de la Región de Murcia (2015-2019), realizando además diversas estancias internacionales (Instituto Arqueológico Alemán de Roma, Universidad de Cambridge, Universidad de Heidelberg y Universidad Tor Vergata de Roma). Ha sido profesor asociado en la Universidad Autónoma de Barcelona (2020), investigador visitante en el Roman Islam Center de la Universidad de Hamburgo (2021) y contratado posdoctoral modalidad "Margarita Salas" en la Universidad de Oviedo (2022). Actualmente desarrollo mi actividad docente e investigadora en el área de Historia Antigua de la Universidad Complutense de Madrid.

Mis campos de investigación se centran en la Historia de Roma, concretamente en la dinastía de los Severos, la Historia de las Mujeres y la iconografía romana, especialmente en el campo de la retratística y numismática. Además, ha publicado trabajos sobre sectores sociales vulnerados de la sociedad como la infancia en el mundo romano. Ha participado en diversos congresos tanto nacionales como internaciones (España, Portugal, Alemania, Francia, Italia o Polonia), fruto de ello son las publicaciones en revistas de reconocido prestigio, así como diversos capítulos de libro. Es miembro del Centro de Estudios del Próximo Oriente y la Antigüedad Tardía (CEPOAT), secretario de la revista Antigüedad y Cristianismo de la Universidad de Murcia y director de la revista Alejandría, también de la Universidad de Murcia.

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
| **Nombre:** | SALES FAVÀ, LLUÍS |
| **Referencia:** | RYC2023-043458-I |
| **Correo Electrónico:** | sales.fava.lluis@gmail.com |
| **Título:** | Crédito privado, jurisdicción y comercio en la Baja Edad Media |

**Resumen de la Memoria:**

The applicant has specialized in several Rural History topics, by studying the standards of living of late medieval peasantry, and specially the ways to access the money market. He has explored how this social group engaged with the legal institutions in order to lend money and to recover unpaid loans. He ultimately has proposed novel ways of understandings the jurisdictional courts that enabled this market. His latest works have taken new paths, towards the consumption of commodities in a broader scale, but still with an eye on the capacity of the lower classes to access the market.

The line of research presented for the Ramon y Cajal grant (2023 call) aims to interpret the commercial trends between Barcelona and Genoa in particular, and their respective regions in general, between the late fifteenth and the late sixteenth centuries. We are willing to analyze the economic integration between Catalonia and Liguria during the sixteenth century.

**Resumen del Currículum Vitae:**

Doctor in Medieval History (Universitat de Girona, 2019), Lluís Sales Favà currently holds a post as a postdoctoral bursary at the Instituto de Estudos Medievais – Universidade Nova de Lisboa, working on a project about about commerce and trade in maritime cities between the fifteenth and the sixteenth centuries (2021-2024). He previously held a postdoctoral post as a Research Associate for the project "Bees in the Medieval world" at the King's College of London, for which he has studied sources from a wide array of archives, both ecclesiastical and public, of different countries: Spain, Portugal, France, Italy and the United Kingdom (2018-2021). He produced a number of academic outputs for this project. This project allowed him to study both the consumption of wax and honey by ecclesiastical and secular institutions, and the international trade of these commodities.

His lines of research include also Rural History and the peasant credit in the late medieval ages, focusing on the proceedings and mechanisms of the local jurisdictional courts implemented in order to prosecute nonpayment and sanction private contracts. He has also devoted some works to other aspects of the peasant economy (livestock breeding and its commercialization, as well as apiculture). At the same time, he has worked on the exercise of jurisdiction by local barons, on taxation (he has edited the nominal list of the fogatjament tax of Barcelona of 1496).

Since 2009 he has been a member of different projects of research funded by the corresponding Spanish Ministry and of a consolidated Research Group (Renda feudal i fiscalitat a la Catalunya baixmedieval), funded by the Comisionado para Universidades e Investigación of the Generalitat de Catalunya.

He has also attended numerous seminars and congresses, both a national and at an international scale, and has organized scientific events. During six years (2012-2018) he worked as an external collaborator at the Museu d'Història de Barcelona, where he has coordinated several teams as an exhibit curator, and has also acted as a historical researcher for a number of projects.

**Resumen de la Memoria:**

As a maritime and nautical archaeologist, during my career, I have been interested in the dynamics of technological change in modern Western society. I addressed this over-arching theme through a well-integrated historical, archaeological, and archaeometric approach, centred on European watercraft and related industries. On this ground, I have developed a robust interdisciplinary, multi-scalar, and cross-cultural analysis of 17th to mid-19th-century shipwrecks, addressing the interaction between warfare, industrialisation, and science, and their consequences on nautical technology both in Europe and abroad.

For my PhD (2016, University of Buenos Aires), I focused on the design, shipbuilding, and operation of British, Spanish, and French warships from 1751-1815. Based on a comparative perspective, I studied a range of technology-related issues in the naval and related industries, with an emphasis on metallurgy, discussing the processes of experimentation, innovation, and conservatism. Since then, I have provided new technical and theoretical insights into modern innovation dynamics, achieving a large track record of high-quality publications.

After being appointed as a Researcher of the National Scientific and Technical Research Council (CONICET) at the Institute of Archaeology, in 2017, I further developed my research. Moreover, as a postdoctoral fellow at the University of Cadiz in 2018 and 2019, I strongly promoted external networking with other academic and research centres in Ibero-America. I furthered this strategy in the following years. This approach allowed me to address the consequences of the European Enlightenment and industrialisation on watercraft and the transnational transfer of technology between modern maritime powers.

Through my participation in funded R+D+i projects in the Americas and Europe, plus research and academic stays developed in Chile (3), Uruguay (2), Brazil (1), Colombia (3), Mexico (4), Portugal (1) and Spain (7), I greatly improved my interdisciplinary, intersectoral, and international experience. Moreover, since 2020 I obtained 5 grants as a Principal Investigator or co-PI from well-known research institutions such as the Institute of Nautical Archaeology (USA), which helped me undertake leading roles and consolidate as a recognised scholar.

Outcomes of my original work are disseminated in articles in top-ranked journals and other publications of renowned editorials, where I occupied a central authorship position. This stands for my capacity to carry out independent, high-quality, and cross-disciplinary research together with diverse specialists. All these contributions show the wide-ranging impact of my research which covers different branches of archaeology, anthropology, history, and interdisciplinary sciences. This pioneering work has become a reference for archaeologists and other scientists of Ibero-America, further addressed by my MA and PhD students, and awarded by first-rate US and EU organisations.

As a Ramón y Cajal fellow, I will analyse the impact of European watercraft on overseas societies, within a context signed by an increasing expansion of maritime powers and struggles for the domain of Spanish-American territories. Thus, I will deepen our understanding of modern innovation dynamics in Europe and overseas, strengthen my long-term research career and enhance my employability prospects.

**Resumen del Currículum Vitae:**

I am an experienced maritime archaeologist focused on the dynamics of technological change in modern society. I have addressed this over-arching theme since my PhD (2016, University of Buenos Aires) through a well-integrated historical, archaeological, and archaeometric approach to the study of watercraft. Thereupon, I have provided new theoretical and technical insights into innovation dynamics in the modern period. As a doctoral and post-doctoral fellow, I was granted competitive scholarships from the National Scientific and Technical Research Council – CONICET (2011–2016) and the University of Cadiz – UCA (2018–2019), among others. Leading institutions such as the Advisory Council on Underwater Archaeology (USA, 2013) and the Society for Archaeological Sciences (USA, 2013) also awarded my original work.

In 2017, I was appointed as a CONICET Researcher (tenured position) at the Institute of Archaeology, UBA. Since 2018, I have taught lessons at the Master in Nautical and Underwater Archaeology and mentored degree students at the UCA. Also in Spain, I actively collaborated with various regional and national centres on underwater cultural heritage (e.g. CASC-MAC, CAS-IAPH, and ARQUA). Moreover, I was a lecturer and researcher at leading universities in Chile, Uruguay, Brazil, Colombia, Mexico, Spain, and Portugal. Thus far, I have supervised 6 PhD theses and 14 MA and BA dissertations and participated in 25 dissertation reading committees. As an early career researcher, I have developed a strong international network and enlarged the scope of my research, addressing how Enlightenment and industrialization in Europe impacted overseas societies.

During my career, I have participated in 35 funded R+D+I projects in America and Europe (1.87M € in total). I was also supported with individual scholarships by the CONICET, UCA, AUIP, SAS, and UNESCO (99.2k € in total), achieving wide international experience and visibility. Since 2020, I have successfully been awarded 5 grants as Principal Investigator or co-PI by the UBA and the National Agency of Science and Technology (Argentina), the National Institute of Anthropology and History (Mexico), and the Institute of Nautical Archaeology (USA). Over the last three years, I have been a researcher of 8 international projects in Chile, Uruguay, Mexico, and Spain, with a leading role in studying nautical technology. In Spain, the UCA's projects HERAKLES and VOLICHE, stand out. I was also supported by the CONICET to conduct international research (2021-2023) and was granted the SAS ECR Research Support Award (USA, 2021).

I have developed a high-quality track record of publications comprising 51 articles in high-ranked journals with a central authorship position. I also published 4 books, 16 book chapters, and 2 encyclopaedia entries in highly regarded editorials (e.g. Springer, Oxford University Press, Florida University Press), 17 conference papers, and 28 newsletter and other brief entries. I presented 84 oral and poster communications at national (40%) and international (60%) meetings, plus 11 keynotes as an invited speaker. I also partook in 16 steering and scientific committees and co-chaired 10 symposiums in European and American meetings, and I have extensive experience as a reviewer and editor for SJR/JCR journals. This active career led me to mature as an independent and recognised researcher.

**Resumen de la Memoria:**

My research experience combines various microarchaeological techniques such as phytoliths and other bio-mineral microremains and infrared spectroscopy to better understand past human behaviours related to plant foraging and exploitation strategies, Pleistocene climatic conditions and site taphonomy. Throughout my career, I have conducted extensive archaeological and botanical fieldwork and laboratory work using high-resolution techniques including FTIR and optical and scanning electron microscopy. My research over the years has contributed to expanding current knowledge of past human history and ancient climate change by providing insights into the intentional use of plants for fire technology, bedding, and site maintenance by past hunter-gatherer populations, the reconstruction of past vegetation and climates and how past hunter-gatherer populations adapted to changing environments. My research has also contributed to a better understanding of site formation and post-depositional processes providing insights into the preservation conditions of plant remains at archaeological sites.

My research has been interdisciplinary and collaborative. Over the years, I have established strong collaborations with national and international teams leading the analysis of phytoliths from Pleistocene archaeological sites across South Africa and Spain. This showcases my ability to work in diverse teams and lead lines of research. I have established myself as a prolific author, having published 32 research papers, of which 25 are peer-reviewed SCI journal articles. My research has gained significant attention with 398 citations in WOS and 730 in Google Scholar. My h-index is 13 in WOS and 17 in Google Scholar, reflecting the impact of my work. My leadership skills and independence are evident through my role in coordinating and leading interdisciplinary research projects and securing funding from international organizations such as the Leakey Foundation, the Palaeontological Scientific Trust, the US National Science Foundation, and the South African DSI-NRF Centre of Excellence in Palaeoscience.

My research plan for the next five years aims to consolidate, integrate, and expand the lines of research that I started as a postdoctoral fellow to better understand the impact of climate changes on hunter-gatherers' populations over the Late Pleistocene across Mediterranean-type ecosystems. In continuation of ongoing investigations, my research plan uses high-resolution multi-dimensional research focusing on three datasets: (i) Comparative studies (reference collections) of botanical remains of modern plants and soils from extant habitats; (ii) Palaeoenvironmental archives from six archaeological sites located in the eastern Mediterranean Iberia and the Cape south coast of South Africa; (iii) The combination of ethnographic investigation of firewood foraging with standardized fire experiments to better interpret remnants of fire in the archaeological record. The research plan will use three analytical dimensions from different scientific fields such as biology, chemistry, and geoarchaeology: (i) biogenic microremains; (ii) organic geochemistry; and (iii) geoarchaeology. The proposed research plan is highly innovative as it combines datasets that have rarely been integrated within the same theoretical and methodological framework.

**Resumen del Currículum Vitae:**

Degree in History (2010, Univ. of Valencia) and Master's in Human Biology (2011, Univ. de Barcelona - UB/Univ. Autónoma de Barcelona). My PhD (cum laude, international doctor – 2016, UB) focused on the study of the past use of plants at the South African Middle Stone Age archaeological site of Pinnacle Point and developing a reference collection of modern phytoliths for comparative studies. I have since been awarded postdoctoral fellowships from the South African DSI-NRF Centre of Excellence in Palaeosciences (2017-2019) and the University Research Council (2019-2021) both at the Univ. of the Witwatersrand. Here, I conducted extensive fieldwork and laboratory research using high-resolution analytical techniques. I also established my own research projects, funded by organizations such as the Palaeontological Scientific Trust and The Leakey Foundation, focusing on expanding the phytolith reference collection in South Africa and studying pyrotechnology through ethnographic investigation and experimental archaeology. Currently, I am a Beatriu de Pinós postdoctoral researcher at the UB. My project develops a new research line applying organic geochemistry and compound-specific isotope analysis to archaeological deposits in South Africa and Spain to provide insights into Pleistocene palaeoenvironmental and hydrological changes.

I collaborate as a phytolith specialist with various international research teams working at several archaeological sites in South Africa and Spain. I am also actively involved in excavations at various archaeological sites, including Waterfall Bluff where I am co-Principal Investigator and co-director of field excavations. I have authored 32 articles, including 25 published in peer-reviewed SCI journals, one of them in Science, and 5 book chapters. I have actively shared the outcomes of my research by delivering oral presentations at prestigious national and international conferences, as well as through invited talks, totalling 39 in number. I have also been invited to peer-review scientific proposals for esteemed organizations such as the European Research Council and The Leakey Foundation and have served as a peer reviewer for 17 SCI journals.

I am actively involved in teaching and supervision. I have taught courses internationally and nationally on palaeoecology and archaeology to graduate and undergraduate students. I have supervised Honours and Master's projects and served as an external examiner for a master's and PhD thesis. Currently, I co-supervise two master's students from two South African universities.

My research has also been disseminated in popular science magazines and media outlets. I have also been involved in community science and outreach initiatives, creating educational content through comics and other media to promote archaeology topics and career options among young South Africans in rural areas.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

My teaching and research activities have been distinguished by ANECA through the positive assessment of my CV as a Profesora Contratada Doctora. Moreover, my postdoctoral trajectory successfully underwent a rigorous assessment by the Spanish National Research Agency with the achievement of the R3 certification as an established researcher. These accreditations attest to the excellence and independence demonstrated of my research.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | DELPU , PIERRE MARIE ANDRE |
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| **Correo Electrónico:** | pierremarie.delpu@ulb.be |
| **Título:** | El martirio en la edad de la política moderna (Europa del Sur, siglo XIX) |

**Resumen de la Memoria:**

Soy un historiador con una amplia trayectoria internacional en el estudio de las revoluciones que acontecieron en la Europa del Sur durante el siglo XIX. Analizo dicho tema desde un marco cronológico y teórico que varios investigadores han identificado como el nacimiento de la política moderna. Mis primeras investigaciones se centraron en el espacio italiano, con una tesis doctoral sobre el Reino de las Dos Sicilias (2017), antes de abrirse a España en una perspectiva de historia comparativa. Pretendo ahora ampliar dicha perspectiva a otras sociedades de Europa del Sur y de América latina en la primera mitad del siglo XIX. Mi investigación actual está dedicada al martirio como categoría transversal de la política y herramienta de legitimación y de politización popular, en un contexto de difícil restructuración del espacio político tras las revoluciones de finales del siglo XVIII.

Mi metodología incorpora las aportaciones de la historiografía internacional con las que me familiaricé en Finlandia ("history of experiences", metodología internacional de la historia de las emociones) y en Bélgica (estudios interdisciplinarios sobre las religiones laicas y la secularización). El martirio político, que defino como la propensión a morir o a sufrir para atestiguar un compromiso político, constituye para mí una experiencia emocional, situada y colectiva que se entiende en el marco de una comunidad determinada.

Mis experiencias internacionales también me han permitido ampliar el enfoque geográfico de mi investigación, lo cual refuerza mi voluntad de replantear mi tema para expandirlo a Europa del Sur. Desde principios de mi estancia posdoctoral en Bélgica, inicié una reflexión sobre las configuraciones comunitarias en las que se fundamentó el martirio político (nivel confesional, nivel local, nivel nacional, nivel transnacional o global), considerando así analizar el martirio político como objeto de historia global.

Mi línea de investigación actual se fundamenta en tres ejes principales:

1. Mi primer proyecto tiene como objetivo abordar el martirio como forma laica de la santidad y patronazgo capaz de estructurar comunidades identitarias. Por ello, abordo un caso monográfico: la trayectoria sacrificial y memorial de Mariana Pineda, desde su ejecución en Granada en 1831 hasta a la actualidad. Dicha investigación desembocará en un libro sobre la figura martirial de Mariana Pineda desde 1831 hasta la actualidad.

2. Otro eje a desarrollar es el replanteamiento del martirio como categoría fundacional de la construcción de la política, con una mirada de historia transatlántica. Pretendo extender la investigación que llevé a cabo sobre la Europa del Sur al espacio iberoamericano de la primera mitad del siglo XIX.

3. En la línea de este segundo proyecto, quiero empezar se empezará una reflexión sobre una posible historia global del martirio político. Las coyunturas de crisis internacionales que produjeron víctimas políticas, como las revoluciones globales de 1848 o de principios de los años 1870, permiten destacar figuras martiriales cuyo impacto va mucho más allá del nivel local o nacional.

Mi estrategia de publicación se enraíza por una parte en mi investigación personal y por otra en la dinámica colectiva del programa AMAPOL que estoy liderando, y privilegia el acceso abierto y la difusión internacional de los resultados de mis investigaciones.

**Resumen del Currículum Vitae:**

Me formé en Francia: soy doctor por la Université Paris 1 Panthéon-Sorbonne, en cotutela internacional con la Università degli Studi Federico II di Napoli (2017). Se me otorgaron contratos de investigación de prestigio en España y Bélgica (antiguo miembro de la Casa de Velázquez, fellow del MIAS, contrato posdoctoral federal del FRS-FNRS). Fui galardonado con becas internacionales que me permitieron realizar estancias de investigación en Argentina, Estados Unidos, Finlandia e Italia. Durante dichas experiencias, he construido una amplia red internacional.

A lo largo de una trayectoria internacional, he desarrollado un perfil internacional cimentado en publicaciones realizadas en diversos idiomas. Los resultados de mis investigaciones previas dieron lugar a dos monografías publicadas en francés y a un libro que se publicará en 2024 en francés y español. También he publicado doce artículos en revistas internacionales de peer-review y veinte capítulos de libros colectivos en español, francés, inglés e italiano.

He adquirido competencias de colaboración y liderazgo que me permiten coordinar el programa internacional AMAPOL - Aspects du MArtyre POLitique (Europe méridionale, 1800-1939). Desde enero de 2023, dicho programa forma parte de la programación científica de la Casa de Velázquez. En este marco, estoy liderando un equipo de casi veinte investigadores, formo parte del comité de organización del seminario periódico del programa así como de los tres congresos anuales que organizamos hasta al final del programa en diciembre de 2025. Impulsé la dinámica de publicaciones del grupo AMAPOL, con un primer libro colectivo que se publicará a finales de 2024 en la Collection de la Casa de Velázquez. Formo parte del equipo de coordinación de dos otros proyectos editoriales: un libro colectivo sobre el martirologio como género literario y herramienta política a lo largo del siglo XIX (entrega prevista a mediados de 2025) y otro sobre el martirio como experiencia de la edificación (entrega prevista a finales de 2025 para publicarse en la colección Palgrave Series in the History of Experiences).

Mi experiencia me permitirá presentar, en 2026, un proyecto de European ERC Consolidator Grant sobre el martirio como categoría fundacional de la política en una perspectiva de historia atlántica.

Aunado a mi experiencia de investigador, he impartido más de 1300 horas de docencia desde 2012, en francés, inglés y español. En Francia, he enseñado varios temas de historia contemporánea a estudiantes de todos niveles (grado, máster, preparación a oposiciones nacionales de enseñanza secundaria, doctorado). Durante mis estancias posdoctorales en la Casa de Velázquez y el MIAS (2020-2022), he estado profesor invitado en la Universidad Complutense, impartiendo clases de máster, y he participado en la formación de jóvenes investigadores dando clases en inglés en el marco de las escuelas de verano del programa europeo CIVIS para predoctorales. Desde 2022, fungo como profesor en el departamento de historia de la Université Libre de Bruxelles, dando clases de grado y máster y tutorando trabajos de fin de grado.

Por último, he participado en varias actividades de formación y transferencia (conferencias abiertas, publicaciones para la enseñanza secundaria, emisiones radiofónicas y podcasts, exposiciones virtuales). Entre 2021 y 2022 fui coordinador editorial de la enciclopedia francesa en línea EHNE, encargándome de la supervisión del eje "L'Europe politique".

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | MAYORAL PASCUAL, ALFREDO |
| **Referencia:** | RYC2023-045545-I |
| **Correo Electrónico:** | alfredomayoralpascual@hotmail.com |
| **Título:** | Landscape Geoarchaeology to explore Holocene socio-environmental interaction and shaping of cultural landscapes. |

**Resumen de la Memoria:**

After a Degree and MSc in Geography in the UAM, I obtained my PhD in Geoarchaeology in GEOLAB (UCA-CNRS, F) and Univ. Lyon 2, where I also completed a postdoc. Since 2020 I am a postdoctoral fellow at the ICAC, where I direct 3 research projects and participate in 12 more. My research is based on an integrative and multidisciplinary approach to Landscape Geoarchaeology. I combine geosciences, palaeoecology and archaeological data, to investigate the relationships between societies and their environments during the Holocene. I am an expert in reconstructing palaeoenvironments and socio-environmental interaction using multi-proxy geoarchaeological tools, including those of geomorphology, sedimentology, paleopedology, geochemistry and soil micromorphology. This constitutes a rather uncommon approach in Spanish research, which allows me to develop my own original investigations presently focused around four axes: 1) Holocene socio-environmental interaction especially around settlements and hydrosystems; 2) Environmental impacts linked to the emergence and development of complex societies and (proto)urbanization processes in the Mediterranean and Celtic areas; 3) Geomorphological forcings during the Iron Age and the Antiquity and their contribution to the onset of the Anthropocene; 4) Multi-proxy and high-resolution geoarchaeological approaches of Mediterranean cultural landscapes.

My research is highly international and includes activities in countries such as France, Greece, Turkey or Spain. I have carried geomorphological and paleogeographic studies (Mayoral et al 2017b; 2018b; 2024a), and I have directed excavations leading to major (geo)archaeological discoveries (Mayoral et al, 2018a). I have uncovered the environmental effects of the emergence of proto-urban phenomena in Gaul (Mayoral et al, 2020b; 2024b), and I have revealed a threshold in anthropogenic impacts in natural systems of the Celtic area in the early Iron age (Mayoral et al, 2018a; 2020a). I have also detected unknown volcanic eruptions and reconstructed palaeohydrological conditions during the Mid-Holocene, questioning the impact of the Neolithization in central France (Mayoral et al, 2021). With my latest research in Greece, I have reconstructed Holocene sea-level changes for the first time in the Northern Aegean, found drowned Neolithic landscapes and detected an ancient tsunami (Mayoral et al, 2024a), and I am studying the harbor of ancient Abdera. Since 2023, I am also setting up the geoarchaeological and palaeoenvironmental studies of the ancient Klazomene (Tr). I have also undertaken studies on mountain landscapes and pastoralism (Pescini et al, 2023; ia.), and about the first farmers of Europe in central Greece. Moreover, I have developed specific techniques and tools for LiDAR data visualization for (geo)archaeological purposes (Mayoral et al 2017a, 2017b, Toumazet et al, 2021).

I will use the RyC grant to develop novel and interdisciplinary research lines beyond my present research directions, including: 1) Development of a novel, specific multidisciplinary approach to analyze ancient soils; 2) Exploratory experimental and quantitative approach to 1st mil. BC anthropogenic forcing of agricultural landscapes; 3) Landscape Geoarchaeology as an innovative approach to Mediterranean cultural landscapes and 4) New digital methodologies for Landscape Geoarchaeology.

**Resumen del Currículum Vitae:**

I am specialist in geoarchaeological approaches of ancient landscapes and past interactions of human societies with their environments. After more than 10 years in multidisciplinary and international research teams, I have developed an uncommon integrated approach and strong multiproxy skills combining geomorphology, paleopedology, sedimentology, geochemistry and soil micromorphology. My main research interests are Holocene landscape evolution resulting of socio-environmental interaction, and paleoenvironmental impacts of complex and (proto)urban societies in the Mediterranean and the Celtic world. My research is highly relevant to understand the trajectories of anthropization of natural systems leading to the onset of the Anthropocene, and to better protect the resulting cultural landscapes.

I have 50 publications (1 more in press, 1 in review, 1 Sp. Issue in edition), including 13 in international peer-reviewed journals (7 as 1st author in Q1 journals), demonstrating my ability to conduct independent high-quality research. I have presented my work 59 times in scientific venues in many European countries, most of them as the 1st author and speaker, and I have organized 2 sessions and 1 international congress. I have directed and coordinated geoarchaeological fieldwork in several countries (Sp, F, Gr, Tr) with international teams, and I am currently participating in 15 national or international projects. As a result of these activities, and of a career conducted largely abroad, I have developed an international profile and a robust research network.

I have developed my leadership skills since the end of my PhD. Besides being the 1st author of most of my scientific production, I have participated in 28 geoarchaeology and landscape archaeology projects in different countries (Sp, F, Gr, Tr) since 2012, of which 5 funded by the AEI and 3 by the EU. In 21 of them I have been responsible for geoarchaeology, and I have directed or co-directed 6 (3 ongoing). I have obtained a total amount of 630.335€ of research funding since 2011. I have also been invited to present my work by an array of international scientific institutions (17 invited talks). This experience shows my ability to design and lead research in Landscape Geoarchaeology.

I am actively involved in outreach and public engagement activities including 2 major transfer of knowledge programs and many dissemination conferences, school talks, radio and TV interviews and press articles. I have also given conferences in archaeological museums and have broadly collaborated with archaeological associations and with territorial entities. I am member of the ICAC Equality Committee where I contributed to implement the Ethical Chart and the II Equality Plan, and I regularly organize equality talks and outreach initiatives including an exhibition in 2023.

I am also committed with the training of young researchers: I have given MSc lectures in several universities in France and Spain, I have mentored 4 MSc thesis in Geoarchaeology, I am part of the training team of 1 MSCA action and of 1 PhD student, and since 2023 I am co-directing 1 PhD. I have also participated in programs of geoarchaeological training of professional archaeologists. I have reviewed articles for prominent journals and editors in my field, I have taken on editorial responsibilities and I am also a reviewer for state agencies.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | GARCÍA GARCÍA, MARCOS |
| **Referencia:** | RYC2023-042965-I |
| **Correo Electrónico:** | marcosgarcia@ugr.es |
| **Título:** | Alimentación, identidad y dinámicas sociales durante la Edad Media: perspectivas históricas y zooarqueológicas |

**Resumen de la Memoria:**

His scientific career focuses on the fields of historical and archaeological research on the Middle Ages. Since 2009, he has been focused on zooarchaeology as a way of approaching foodways, socio-cultural changing identities, and the systems of production and exchange of animal products during this period, contributing to the definitive consolidation of this line of research in the heart of historical and archaeological research on the medieval period in Iberia. His main scientific contributions concern three lines of research.

Firstly, as a result of his doctoral thesis (MECD-FPU, UGR) and his second postdoctoral contract (MCIN-JdC-F, UA), he has used zooarchaeology to shed light on new topics, such as the recognition of hitherto strategies of consolidation of the Umayyad state in Iberia (García, 2023a), the definition of the process of social Islamisation of al-Andalus (García, 2023b; 2022), the identification of Mozarabic groups through the study of eating habits (García et al., 2021a), the analysis of culinary practices in early al-Andalus (García and Moreno, 2021), or the role of livestock in the Andalusi agrarian system (García and Moreno, 2018), among others.

A second area of interest in his career concerns the study of the multicultural component of frontier societies and agriculture during the medieval period. This line of research has been approached thanks to his role as head of zooarchaeological analysis and sampling for biomolecular analysis of diet in humans and animals in three international projects: Landscapes of (Re)Conquest (AHRC-AH/R013861/1), MEDGREENREV (ERC-2022-SYG 101071726) and EVERYDAYISLAM (ERC-2020-STG 949367). These postdoctoral contracts demonstrate the PI's leadership in managing with autonomy and independence key aspects of three international projects, benefiting from the collaboration and active integration in international research teams composed of specialists in various fields. The work carried out is generating new knowledge concerning the study of daily life in medieval frontiers (García, in press-a), the recognition of ethno-religious Morisco (García et al., 2021b) and Jewish (García et al., in press-b) minorities, or zootechnical change during the medieval period (García, 2023c).

Finally, over the last years he has laid the foundations for a new line of research, consisting on the study of food during the medieval and early modern period from a multidisciplinary approach that includes a committed gender perspective. As a result of this new direction in his career, it is worth highlighting the application to the latest call of the Marie Skłodowska-Curie Actions programme at the University of Leiden (resolution soon); the holding of the scientific workshop "Cocinando culturas: líneas y enfoques de la arqueología social de la alimentación", held in November 2023 at the UA and with the candidate as first director (monograph in preparation); and the award of a project as PI to the call for Applied Research Projects of the UGR Research and Transfer Plan 2023 (159,000€ starting on 01/04/2024), thanks to which he will lead a multidisciplinary team composed of 5 researchers specialising in various fields (archaeobotanical, ceramic analysis, zooarchaeology, anthropology and gender studies).

**Resumen del Currículum Vitae:**

The fellow has a remarkable track record, including international mobility and scientific collaborations and publications in high-impact-factor journals. After completing his PhD (2019), he was a Postdoc Research Associate at BioArCh (University of York) as lead zooarchaeological specialist and was responsible for sampling for biomolecular dietary analysis of the AHRC project ' Landscapes of (Re)Conquest' (LoR). This allowed him to manage with autonomy and independence key aspects of one of the main work packages of a complex project, benefiting from close collaboration and active integration within an international team composed of specialists from various disciplines. Between January 2022 and December 2023, he joined as a Postdoc Researcher ' Juan de la Cierva' (Spanish Ministry for Science) at the University of Alicante. During this time, he continued to lead the zooarchaeology of the LoR-project, becoming also the lead zooarchaeologist of the ERC-Starting Grant project ' EVERYDAYISLAM' . In January 2024 he joined the Department of Medieval History of the University of Granada thanks to a competitive contract as a Postdoctoral researcher for the ERC-Synergy project ' MEDGREENREV' . Finally, in April 2024 he will start his own research project as PI titled ' CILANTRO-Cocinando al-Andalus: alimentación, género y dinámicas sociales durante primera época andalusí (c. 700-1000)' (A-HUM-239-UGR23) (159,000€).

He holds the ANECA accreditation as Profesor Contratado Doctor and has extensive experience both in international (27 months as predoc, 30 months as postdoc) and national (3 months as predoc, 24 months as postdoc) research centres other than his alma mater (UGR). This experience has represented an enormous added value to his career, placing him in a strong position in international scientific networks, which is reflected in numerous collaborations in the form of his participation in 17 research projects (including 1 AHRC, 1 ERC-StG and 1 ERC-SyG) and 55+ conferences (most of them international). He has published 30+ articles, and led the zooarchaeological analysis of some of the most relevant Iberian medieval archaeological sites. Has lectured in undergraduate and postgraduate study programs in History and Archaeology at both UGR and UA (29.5 ECTS), being also involved in the training of future researchers in the field of zooarchaeology through zooarchaeology courses (10 hours) offered as a workshop of the Master's Degree in Archaeology of the UGR, the Permanent Education Center (UA) and, from April 2024, the Mediterranean Centre (UGR). As a result, he has mentored and/or co-supervised 1 Postdoc, 1 PhD, 3 TFGs, 2 TFMs, and is the supervisor of a predoctoral project currently applying to the FPU programme. He is also a regular member of Master examination panels both at UGR and UA, reviewer of prestigious international journals (e.g. Archaeological Science, Medieval Iberian Studies, Environmental Archaeology), as well as a reviewer of the funding predoc scheme Preludium of the Polish National Science Centre. His concern for the transfer of knowledge is reflected in its participation in three teaching innovation projects and various dissemination and transfer activities.

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
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| **Correo Electrónico:** | alfonsoh33@gmail.com |
| **Título:** | Corrupción y mecanismos de control en la Monarquía Hispánica del Antiguo Régimen |

**Resumen de la Memoria:**

Las investigaciones del solicitante se insertan en una de las líneas de investigación de mayor actualidad en el ámbito de la Historia Moderna, como es la corrupción en la Monarquía Hispánica del Antiguo Régimen. En nuestro caso, hemos aplicado los objetivos, métodos y debates de la historia de la corrupción a la investigación de las instituciones del comercio sevillano con América, la Casa de la Contratación y el Consulado de Sevilla.

Hemos estudiado los mecanismos de control de la corrupción puestos en marcha por la monarquía, principalmente visitas y juicios de residencia, y en la actualidad, pretendemos continuar una línea de investigación que incorpore a estas problemáticas los mecanismos de negociación, tales como composiciones e indultos, negociados entre la corona y los espacios informales de poder -consulados de comercio, comerciantes franceses establecidos en Cádiz- que condonaban prácticas ilícitas -fraude, contrabando y corrupción- en la Carrera de Indias durante el siglo XVII.

**Resumen del Currículum Vitae:**

Doctor en Ciencias Humanas y Sociales con mención internacional por la Universidad de Almería con la tesis doctoral Controlar la corrupción y reformar la administración. La Casa de la Contratación y el Consulado de Sevilla a mediados del siglo XVII, dirigida por el Catedrático de Historia Moderna de dicha Universidad, Francisco Andújar Castillo, con la calificación de sobresaliente Cum Laude. Entre sus trabajos más destacados está un libro dedicado a uno de los mecanismos de control de la corrupción en la Monarquía Hispánica del Antiguo Régimen: las visitas. Aborda una visita a la Casa de la Contratación de Sevilla a mediados del siglo XVII, que no había sido estudiada de manera monográfica. La obra se inserta en una de las líneas de investigación de mayor actualidad en el ámbito de la Historia Moderna, como es la corrupción en la España del Antiguo Régimen, y aplica sus objetivos y métodos a la investigación de la Casa de la Contratación, que en gran parte es todavía una gran desconocida. Entre sus artículos publicados en revistas indexadas (SCOPUS; WOS...), ha desarrollado aportaciones en la línea de investigación relacionada con los mecanismos de control de la corrupción, visitas y juicios de residencia, caso de los artículos publicados en Revista de Historia Moderna y Revista de Historiografía. Asimismo, ha publicado artículos que tratan aspectos concretos de la visita, como su carácter reformista de las instituciones, caso del publicado en Memoria y Civilización; ha profundizado en los efectos que tuvo la venalidad de cargos en las prácticas corruptas en la Contratación en el artículo de Anuario de Estudios Americanos. Asimismo, ha analizado los vínculos existentes entre los comerciantes sevillanos y los oficiales de la Contratación a través del mecanismo de las fianzas que los segundos debían aportar antes de ejercer sus empleos, caso del artículo de Colonial Latin American Review, galardonado con la mención de honor de la revista al mejor artículo publicado en 2019. En la etapa postdoctoral, sus líneas de investigación se han ampliado hacia el fraude, el contrabando y la corrupción en la Carrera de Indias, y ha publicado varios artículos que incardinan con el conocimiento de las prácticas ilícitas en las instituciones del comercio con América, caso del artículo de Temas Americanistas sobre las elecciones a prior y cónsul del Consulado de Sevilla a mediados del siglo XVII, plagadas de mecanismos fraudulentos; o el artículo sobre la influencia en el aumento del fraude en el comercio Atlántico de las prácticas corruptas de oficiales de la Casa de la Contratación y de las armadas de Indias, caso del artículo de Obradoiro de Historia Moderna. Estas investigaciones han sido comunicadas a la comunidad científica en más de 25 congresos y seminarios internacionales en los que el solicitante ha sido ponente. En su formación predoctoral ha desarrollado tres estancias de investigación: tres meses de duración en 2017 en L' École des Hautes Études en Sciences Sociales de París; tres meses en 2018 en Sorbonne Université de París; y dos meses en 2018 en la Universidad de Sevilla. En la etapa postdoctoral, logró un contrato de Personal Investigador Doctor en el Programa Margarita Salas, cuyo primer periodo comprendido entre el 1 de enero de 2022 y el 31 de diciembre de 2023 ha sido desarrollado en el Laboratoire Mondes Americains de EHESS de París.

**Resumen de la Memoria:**

Mis líneas de investigación se han centrado en la historia social y de de la vida cotidiana bajo el régimen franquista (1939-1975). En concreto, he estudiado las actitudes sociopolíticas, las prácticas de resistencia cotidiana, las políticas sociales, el control socio-moral y el aprendizaje democrático. Como investigadora postdoctoral, he dedicado especial atención a "los años del hambre" (1939-1952) y, últimamente, a las experiencias y prácticas de los niños bajo el franquismo. La financiación obtenida a través de contratos, estancias y proyectos de investigación me ha permitido realizar aportaciones científicas de relevancia en este ámbito de conocimiento. De un lado, en forma de conferencias y seminarios nacionales e internacionales (más de 40) en los que he participado tanto como ponente invitada como comunicante oral. De otro, mediante mis publicaciones (más de 50) sobre la historia social y la historia de la vida cotidiana bajo el régimen franquista en revistas y editoriales de primer nivel y gran impacto -muchas de ellas internacionales-, en acceso abierto y mayoritariamente como autora única. Respecto a la movilidad y la internacionalización, en los últimos años he estado vinculada contractualmente a cuatro instituciones distintas como investigadora predoctoral y postdoctoral. He realizado tres estancias predoctorales con financiación, dos en el extranjero y una nacional. He sido contratada postdoctoral en la Radboud University (Nijmegen, Netherlands) y el NIOD Institute (Ámsterdam, Países Bajos) durante veinticuatro meses (15/02/2020-01/03/2022). Actualmente realizo una estancia postdoctoral con una ayuda José Castillejo para jóvenes doctores del Ministerio de Universidades en el Instituto de Ciências Sociais da Universidade de Lisboa. En total he conseguido financiación para realizar estancias en centros internacionales de reconocido prestigio por un periodo de 33 meses. Desde 2020 soy miembro del equipo de investigación del proyecto neerlandés "Heritages of Hunger" (Radboud University) y del consorcio internacional homónimo. Fruto de estas estancias y contratos son: doce colaboraciones en revistas y editoriales extranjeras (ensayos-reseña, artículos, special issues y capítulos de libro); más de una docena de congresos internacionales; actividades de transferencia en inglés (exposiciones, revistas, periódicos y blogs); y docencia en inglés como profesora invitada en la Radboud University. Asimismo, colaboro en el repositorio educativo en abierto "Heritages of Hunger". En cuanto a mi independencia y liderazgo como investigadora, he sido investigadora principal de dos proyectos de investigación competitivos (una Beca Leonardo de la Fundación BBVA financiada con 32.000€ y un proyecto para jóvenes doctores del Plan Propio de la UGR financiado con 1.500€), un Proyecto de Innovación Docente; un proyecto José Castillejo; un proyecto Juan de la Cierva Incorporación; el subproyecto "Spain's Años del Hambre" (Heritages of Hunger); y la exposición itinerante "La hambruna silenciada. El hambre durante la posguerra franquista (1939-1952)" (Secretaría de Estado de Memoria Democrática).Además, formo parte de dos grupos de investigación y de dos Redes de Investigación del Programa Estatal. En los últimos años he participado en catorce proyectos de investigación financiados en convocatorias competitivas internacionales, nacionales y autonómicas.

**Resumen del Currículum Vitae:**

Respecto a mis aportaciones científicas, la financiación obtenida a través de contratos, estancias y proyectos de investigación me ha permitido generar resultados de relevancia, comunicados mediante las siguientes publicaciones: veintidós artículos en revistas especializadas indexadas en JCR, SCOPUS y/o SCImago; dos monografías en Publicacions Universitat València y Comares, que han sido reseñadas en más de una decena de revistas como Historia Agraria, Studia Historica o Historia del Presente y en periódicos como El País; cinco coordinaciones de volúmenes colectivos en Marcial Pons, Sílex, Comares y la Editorial Universidad de Granada; veintiocho capítulos de libro en editoriales de primer nivel; un dossier en la revista Arenal junto a Mary Nash; dos coordinaciones de libros de actas de congresos; seis comunicaciones en libros de actas de congresos de historia contemporánea; diez reseñas en Contemporary European History, Tijdschrift voor Geschiedenis, Revista de Historia Actual, Andalucía en la Historia, Historia Actual Online, Revista Universitaria de Historia Militar, Nuestra Historia, Historia del Presente y Arenal. En más de una treintena de estas publicaciones figuro como primera autora. Respecto al impacto, según Google Scholar, mis publicaciones han sido citadas 138 veces (índice-h: 6). Todo ello ha supuesto una importante contribución a la generación de conocimiento en el ámbito de la historia social y la historia de la vida cotidiana del régimen franquista (1939-1975) que, a su vez, me ha permitido adquirir nuevas capacidades científico-técnicas para seguir avanzando en mi carrera investigadora. Entre estas publicaciones se cuentan una docena de colaboraciones internacionales en inglés en volúmenes colectivos en University of Exeter Press, Routledge o Bloomsbury y en special issues en revistas como European History Quarterly fruto de mis estancias internacionales predoctorales (London School of Economics y Bristol University) y postdoctorales (Radboud University/NIOD Institute y Universidade de Lisboa). Respecto al liderazgo y al ejercicio de responsabilidades científicas, soy la investigadora principal de una Beca Leonardo financiada por la Fundación BBVA (32.000€); y de un proyecto financiado por el Plan Propio de la UGR (1.500€). También he formado parte del comité organizador de catorce actividades científicas. Respecto a la formación de jóvenes investigadores, he sido secretaria y miembro del tribunal de dos tesis doctorales defendidas en 2022 en la UGR; y he emitido uno de los informes en calidad de experto para la obtención de la Mención Internacional de una tesis doctoral defendida en 2021 en la UGR. Durante dos cursos académicos he estado a cargo del seminario permanente del Dpto. de Historia Contemporánea de la UGR. He constituido un equipo de investigación en torno al proyecto del que soy IP, del que forman parte otros seis investigadores, entre ellos doctorandos y postdoctorales. Respecto a la evaluación de investigadores, he sido uno de los tres miembros del jurado del Premio Mary Nash de la Asociación de Historia Contemporánea 2023. Además, soy miembro del Comité Editor de los Documentos de Trabajo de la Sociedad de estudios de Historia Agraria (SEHA) y he evaluado originales para las editoriales PUV y Comares y para más de una docena de revistas indexadas como Culture & History Digital Journal o Historia Social.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

**Área Temática:** Estudios del pasado: historia y arqueología
**Nombre:** BENATI , GIACOMO
**Referencia:** RYC2023-045299-I
**Correo Electrónico:** giacomo.benati@gmail.com
**Título:** At the Origins of Development: An Interdisciplinary Perspective

**Resumen de la Memoria:**

In my career, I published 29 scientific contributions–the majority as single or leading author–, 11 of which in international peer-reviewed journals (9 in JCR Q1), 9 book chapters and 9 working papers. In addition to the top journals in archaeology (J. Archael. Res., J. Archaeol. Sci.), I published in high-impact multidisciplinary outlets (PNAS, Nat. Hum. Behav.) and in economics (Econ. Hist. Rev., J. Comp. Econ.). These publications are cited more than 290 times according to Google Scholar and generated substantial coverage in popular media, new outlet and blogs. I further disseminate the findings of my research lecturing and participating to international academic meetings, conducting outreach activities in museums, cultural associations and schools, and by sharing my research outputs through open access practices. After obtaining my PhD, I conducted postdoctoral academic activity in top research centers in three different countries, such as UNIBO, U. Tübingen and U. Barcelona. My activity focuses on questions related to digital humanities, urbanization, state formation and long-run development, through a multidisciplinary approach. To this end, I formally trained in computational archaeology, data science and historical economics, and I developed a network of International collaborations with groups of archaeologists, historians, economists and political scientists. I took part to several archaeological expeditions and externally funded projects in Italy, Turkey, Iraq, US, Germany and Spain. I led as PI or co-PI three international projects (funding >100k €) and conducted academic stays at several top international institutions (UPF, Stanford, UPenn), organized academic meetings in several countries, taught courses in Bologna, Tübingen and Barcelona on the social and economic history of the ancient world and tutored students in curricula of archaeology and historical economics. Furthermore, I received several awards and distinctions, such as the MSCA Seal of Excellence, the IAA Prize for best article, etc. Finally, I am part of the editorial board of the journal Cambridge Elements in Law, Economics and Politics as Associate Editor. Currently, my research activity at UB, sponsored by a Maria Zambrano grant, revolves around the integration of ancient world studies and economics in the analysis of key components of development, over the long-run, such as climate change and political evolution, the origins of trading network, violence and standards of living in ancient and pre-industrial societies. Next, I plan to develop three major lines of research: (i) The origins of markets, (ii) the origins of inequality, (iii) state capacity in ancient times. This research will further promote the cross-fertilization between archaeology, ancient history and economics, familiarizing social scientists with the data-making power of historical disciplines and humanists with the analytical power of inferential statistics and economic theories. From this agenda, I foresee to obtain up to 6 potential publications, 5 new datasets and 2 competitive grant proposals. I am confident that this work, if funded, will eventually help me obtain a stable position within the Spanish university system and establish myself as leader of an interdisciplinary team.

**Resumen del Currículum Vitae:**

I am an ancient world scholar trained in data-driven humanities and quantitative social sciences. I received my PhD (2014) in History/Archaeology from the University of Turin. My postdoctoral career can be divided in three stages. Between 2015 and 2020 I worked as postdoctoral fellow at the Department of History and Cultures of the University of Bologna. During this period, I investigated topics related to the emergence of urbanization and governance in ancient societies, I experimented with spatial, and computational methods, and I published more than 15 papers. Furthermore, I participated to several externally funded projects. I was also funded to conduct academic stays at top international research centers (UPENN, Stanford, UPF Barcelona), and I received numerous awards and bursaries. At UNIBO I taught seminars and laboratories for BA and MA degrees of anthropology and history. Between 2018 and 2020 I coordinated two projects as PI and co-PI, targeting the origins of political institutions in ancient Mesopotamia through an approach combining archaeology and economics. These projects already generated high-impact publications and promoted the integration between social sciences and historical disciplines. This work allowed me to not only familiarize with applied social scientific methods and economic theories, but also to acquire experience in compiling large datasets, develop competitive grant proposals, and manage projects. In 2020 I took a position at the Faculty of Economics and Social Sciences of the University of Tübingen. In Tübingen I joined as team member the SFB1070 project funded by the German Science Foundation. The project analyzes the use of resources in the ancient world through a collaborative approach linking archaeologists, anthropologists, historians, and economists. This work allowed me to further develop my interdisciplinary approach, expanding my knowledge of quantitative methods and my capacity to work in multidisciplinary teams. Furthermore, I taught economic history courses for MA degrees in Economics. Notably, in 2021 the European Commission awarded me the Seal of Excellence for a MSCA project. In 2021 I joined the editorial board of the journal Cambridge Elements in Law, Economics and Politics as Associate Editor. Finally, in April 2022 I joined the Department of Economic History (UB) thanks to a Maria Zambrano grant. At UB I am part of the research hub with various projects on the historical development of state capacity. I contribute to the activity of this hub by investigating topics such as climate change and political evolution, the formation of trading networks, violence and standards of living in the past. This agenda is not only producing high-quality outputs, but also contributing to expanding the teaching offer of UB Economics by promoting a tighter integration with ancient world studies. My unique mix of expertise and approach, allow me to publish my research findings across different disciplines–i.e. archaeology, economic history, institutional economics–reaching multiple scientific communities and generating a considerable engagement. Over the course of my career, I attracted more than 100k € of personal research funds and I accumulated experience in developing and managing international projects far exceeding 10m €

**Resumen de la Memoria:**

Since completing my MA in Medieval Studies (UAM, 2014), the development of my research is based on an exceptional framework for studies on intercultural relations, that of Medieval Iberia. Working 3 years (2013-2016) as an early stage researcher in an ERC Advanced Grant (CORPI) at the ILC-CSIC, in a team with leading scholars from different countries, allowed me to get to know diverse academic contexts. In this stage, particularly focusing on the case of the Moriscos, I began to be interested in how al-Andalus was imagined after its loss, one of the topics that I will explore in the future.

My PhD dissertation (UAM, 2020), for whose realization I was granted with a FPU, was devoted to the study of the discourse of jihad and the memory of the first battles of Islam. It is an exponent of my researcher profile: the combination of Medieval and Islamic Studies. The methodology of Memory Studies, together with the transcultural approach, is its main theoretical framework. On the one hand, I have understood the discourses of jihad in al-Andalus not only as a model of war against other religions, but as a discursive tool directed primarily towards an internal audience. On the other hand, I have conceptualized the first battles of Islam as sacred sites of memory granting authority to different discourses, including that of jihad.

After completing my PhD (2020), I have enjoyed 3 international postdoc grants. The first, - RomanIslam Center (U.Hamburg) -, was part of a major project (DFG Romanization and Islamication in Late Antiquity). The project I presented aimed to study how the memory of the conquest and of the process of Islamization was created and modified over time. I also had the opportunity to extend my stay at the U.Hamburg thanks to earning a DAAD Research Grant - project The Islamization of North Africa and Iberia: a Sites of Memory Database. After spending almost two years at Hamburg, I succeeded in being selected for a Juan de la Cierva, at the IH-CCHS-CSIC. After a month enjoying this contract, I started working (02/2022) at the UAM after obtaining a position as Assistant Professor of Medieval History, which I am currently enjoying.

Lines of research to be developed:

Line A "The loss of al-Andalus and the creation of memory", will study the reaction produced by the loss of al-Andalus between the 11th-15th centuries, which ideas were developed and how they have been used in modern society. The first goal is to analyze if this reaction generated discourses of Islamic "reconquest", whether they were political and active, rhetorical or literary. The second goal is to study how this reaction created or renewed feelings of territorial belonging. I will deal with several approaches in which I have specialized in the past years: transcultural analysis, the use of memory as an element of intercultural mediation, or the production of discourses on identity.

Line B "The Islamization of the Maghrib and al-Andalus: memory and sacralization", aims to study the memory generated around the process of Islamization of the Maghrib and al-Andalus, that is, which places of memory were generated around the creation of this new Islamic space. It focuses on the analysis of the "narrative" memory of Islamization. Another of the main aims of this line will be the study of how this narrative memory is related to the pre-Islamic past of the analyzed spaces.

**Resumen del Currículum Vitae:**

After completing my MA in Medieval Studies (UAM,2014), I was granted a FPU contract to carry out my PhD (UAM, 2020, Cum Laude), devoted to the study of jihad and the memory of the first battles of Islam. During my PhD, I have studied Arabic in institutions such as the U. Jordan (Casa Árabe Grant), and conducted funded stays in the S. M. Ben Abdallah University (Fes) and the U.Göttingen. I also worked (2013-2016) as an early stage researcher in an ERC Advanced Grant (CORPI) dedicated to topics such as overlapping religiosities. In just 2 years after completing my PhD (2020-2022), I have already enjoyed 3 international competitive postdoc grants (Postdoctoral Fellowship, DFG RomanIslam Centre/U.Hamburg; DAAD Research Grant/U.Hamburg; Juan de la Cierva, IH-CSIC), and 1 Assistant Professorship (Prof. Ayudante Doctor-Medieval History, UAM, 2022-) since then. I have contributed to the knowledge on Medieval Islamic West, on topics such as: Andalusi Christians; interreligious relations; jihad; creation of memory; sacralisation of space, and historiography of al-Andalus. My research has been recognised not only with grants, but also with awards such as The Article of the Month Award - Mediterranean Seminar, the Simon Barton Conference Prize-SMM or the PhD Extraordinary Award 2020 (UAM). Likewise, my latest book (Ejércitos benditos, EUG, 2020) received 10 reviews in 4 languages.

Results: A-Participation in more than 60 scientific publications: 4 books (EUG, Spanish Society of Medieval Studies, La Ergástula); 1 accepted book (Brill); 3 co-edited books in press (Trivent, La Ergástula, EUG); 3 co-edited special issues (e.g. Der Islam, Religions); 3 refereed journal articles in press (e.g. Imago Temporis, Arabian Humanities); 16 refereed journal articles (e.g. Der Islam, Studia Historica, al-Masaq, al-Qantara); 5 book chapters in press (e.g. Brill, Bloomsbury); 19 book chapters (e.g., Routledge, Palgrave MacMillan); 1 dictionary entry in press (E. of Islam 3,Brill); 3 dictionary entries (ABC-CLIO); 8 book reviews (e.g. Hispania, J. Islamic Studies). B-Participation in more than 85 scientific events: 73 contributions in conferences and seminars (e.g., Cambridge, U.Hamburg, U.Radboud, U.N. Lisboa, Princeton, U.Ghent, U.Aga Khan); organization of 8 conferences (e.g. UAM, U.Hamburg, CSIC); organization of 2 lecture series (UAM). C-Researcher in 11 national and international projects (e.g. ERC, U.Hamburg, UAM, CSIC); D-Member of journal editorial boards (e.g. Medievalismo, Sehepunkte), editor of the book series "Al-Andalus" (Spanish Society of Medieval Studies); evaluator of journals and publishing houses (e.g. al-Masaq, Nottingham Medieval Studies, Brepols).

Regarding social impact, I have published 22 articles in magazines (e.g. Foreign Policy, National Geographic), and organized events such as the film series Luz y sombra: representaciones de la Edad Media en el cine (2023/24). I am editor of the online magazine Al-Andalus y la Historia, and media have echoed my results (e.g. Derin Tarih, Cadena Ser, El País).

Regarding mentoring, I have taught and organized 4 post-graduate courses (CSIC, UAM, U.Hamburg) and, as Assistant Professor (UAM), I have taught BA and MA courses on Medieval history. I have been or currently am the supervisor of 2 BA, 5 MA and 1 PhD dissertation. I am Head of the Quality Committee of the PhD Program "Estudios Hispánicos" (UAM).

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
| **Nombre:** | PABLOS FERNÁNDEZ, ADRIÁN |
| **Referencia:** | RYC2023-045715-I |
| **Correo Electrónico:** | adrizaino@yahoo.es |
| **Título:** | Evolution of the human foot in genus Homo |

**Resumen de la Memoria:**

I am paleontologist with broad experience in human osteology and evolution. My research line is the evolution of postcranium in genus Homo, focused on the feet of extinct hominins: mainly H. antecessor (Sierra de Atapuerca) and the Middle Pleistocene hominins from Sima de los Huesos-SH (Atapuerca). I also have 4 secondary lines of research: 1) Neandertals: description of new foot remains. 2) Paleoecology of Neandertal occupations at Sierra de Atapuerca (Galería de las Estatuas site; PI: J.L. Arsuaga). 3) Paleoecology and transition from Mid- to Upper Paleolithic inland Iberia. 4) Body size estimations (stature and body mass) in human evolution. I also have a broad experience in archaeopaleontological field work (19 years).

Related to my main research line, I have obtained interesting results that have been published at the most important journals of the field of human evolution, such as Journal of Human Evolution and American Journal of Physical Anthropology and also in general multidisciplinary Journals such as Science and PNAS. The main results in this line are:

-Comparative study of unpublished human remains from SH: Neandertal derived features in the foot mainly related to body size were already present in the Middle Pleistocene population of SH, but this population did still not show the full suite of Neandertal characteristics (Arsuaga et al., 2014;2015; Pablos et al., 2013a;2014;2017).

-Neandertals, The study of foot bones from 3 Mousterian sites: These fossils are metrically and morphologically considered as Neandertals. Furthermore, the robust body size relate them to other earlier Homo species such as those from SH (Pablos et al., 2019a, 2019b, Pearson et al., 2020).

-Body size estimation in human evolution: In relation to Australopithecus, early Homo is characterized by larger average body size. Additionally, within later Homo, stature and body mass evolution follow different trajectories: average modern stature is maintained from ca 1.6 Ma, while consistently higher body masses are not established until the Late Early Pleistocene or Middle Pleistocene (Pablos et al., 2013b; Will et al., 2017).

-Upper Paleolithic Homo sapiens: Taxonomic re-assignment of a human foot bone, formerly clasified as a Neandertal, as a H. sapiens from Cueva de los Torrejones in Guadalajara, Spain (Pablos et al., 2018). This work triggered in the application, and obtaining, for a competitive research project in the karstic area where it was found (Tamaján, Guadalajara, Spain) from which I am currently co-PI.

-Early Pleistocene Homo: Study of hand and foot fossils from the Early Pleistocene levels from Atapuerca. They were established as different of modern humans and Neandertals, and probably they belonged to Homo antecessor and Homo sp. Large and robust bodies were present during the Early Pleistocene in European Homo species, suggesting this as a primitive trait (Lorenzo et al., 2015; Pablos et al., 2012)

Regarding the secondary lines of research:

-I have described Neandertal remains from the sites of Regourdou (France), Amud (Israel) and Estatuas (Pablos et al., 2019a; 2019b; Pearson et al., 2020).

-The publication of the first Neandertal cave site at the Sierra de Atapuerca (Galería de las Estatuas; Arsuaga et al., 2017).

-The finding of new important sites inland Iberia with archaeological record from the Middle-Upper Paleolithic transition.

**Resumen del Currículum Vitae:**

Education
2008: Bachelor degree in Biology. (Univ. Alcalá-UAH)
2010: Diploma Estudios Avanzados in Paleontology (Univ. Autónoma Madrid-UAM)
2013: European PhD in Paleontology (UAH) awarded with Tübingen research prize for Early Prehistory and Quaternary Ecology

Positions
2023-current: Assistant teacher. Univ. Complutense de Madrid. 01/09/2023-current.
2021-2023: Postdoctoral researcher-EMERGIA Program. Sevilla Univ. 01/09/2021-31/08/2023
2016-2021: Postdoctoral research contract. CENIEH (Burgos). 01/04/16-31/03/2021
2015-2016: Postdoctoral research and teaching contract. Univ Tübingen (Germany). 01/10/2015-31/03/2016
2015-2015: Postdoctoral research contract. UAH. 01/02/2015-30/09/2015
2013-2014: Postdoctoral research contract. Univ. Burgos (UBU). 01/11/2013-31/10/2014
2008-2012: Grant "Formación de Personal Investigador (FPI)". Minist. Cc. e Innovac. (MICINN). 01/09/2008-31/08/2012
2007-2007: Study of the faunal remains of the site "El Cerro de las Baterias" del término municipal de la Albuera (Badajoz). TERA S.L. 2/10-16/11/2007
2005-2005: Grant for sorting of micromammal fossils . Museo Arqueol. Regional (Madrid). 01/10-31/12/2005

Publications & citation statistics
50 scientific (peer-reviewed) publications, 26 of which are in SCI and 16 from Q1 (2 Science and 1 PNAS), 19 as 1st/2nd author

Citations: 1427 (G. Scholar); 966 (Scopus); 875 (WoK). H index: 14 (G. Scholar); 13(Scopus, WoK)

Teaching
Teaching experience in several universities and public national and international centers (Sevilla Univ., Master of research in sciences - UAH, UNED-Tudela, program Teach at Tübingen – Tübingen Univ., Program "Univ. Mayores-UAH, Degree in Biology-UAH, Master of teaching-UAH, Univ.

Burgos–UBU abierta, Centro Reg. Innovac. y Formac. "Las Acacias", Dpto Paleontología-UCM).Co-director of a final degree work–TFG (2014/2015-UAH) and co-director of 11 master Theses–TFM (2014/2015-2020/2021-UAH)

My main research focus deals with the morphology and anatomy of the postcranial skeleton in genus Homo mainly related to the feet. It has to do with taxonomy and body size estimations and reconstructions (stature & body mass) of fossils found in Atapuerca and in other Neandertal and Homo sapiens sites. Co-director of the excavation in the archaeopaleontological sites of Tamajón (Guadalajara)

Honorary researcher teacher of Dept. Life Sciences (UAH) 2015/2016-2019/2020. Scientific affiliate (CENIEH) 01/01/2022-current

Contribution to 42 communications in scientific meetings, 38 at international level and 2 invited contributions

Participation in 40 research projects. 11 as PI, 9 competitive and 1 at European level. 9 competitive projects, 7 at national level funded by governmental ministry and 2 at European level as researcher

13 research stays have been done, 9 in international R+D centers and 3 postdoctoral stays: Cleveland Mus. Nat. Hist.-USA (62days), Rheinisches Landesmuseum Bonn-Germany (3days),  Museé d'Art et Archaeologie du Perigord-France (2days), Mus. Nat. D'Hist. Naturelle-París, France (7days), Depart. Phys. Anthrop. Univ. Cambridge (94days), Nat. Hist. Mus.-London, England (4days), Univ. Tübingen-Germany (6 months-postdoctoral + 10days) among others

Scientific reviewer: Chinese Sci. Bull.; Archaeol. & Anthropol. Sci. (X2); Encuentro Jóv. Investig. Paleont. (EJIP) (X2); Scientific reports (X2); Metodé; J. Human Evol.; Am. J. Phys. Anthrop

**Resumen de la Memoria:**

The current production of olive oil in the south of the Iberian Peninsula has its roots in Roman times. My work contributes to the evaluation of this historical heritage through the study of the amphorae which transported this oil when the Baetican Province was one of the main exporters regions of this product in the Mediterranean sea from 1st BC to 5th century AD.

I have developed my carreer in Spanish and French academies. This allowed me to combine my deep interest for the South of Spain in Roman times, the region where I come from, with a stimulating research program from France. I have played an essential part in the Franco-Spanish research program, OLEASTRO, funded by the LabEx Archimède (CNRS, Agence Nationale de la Recherche, Ministry of Culture). The territory of the Guadalquivir Valley, one of the most fertile in the Roman world, was divided into three subregions (Astigi, Hispalis, Corduba), each one attributed to a different PhD candidate for the study of the production of oil bearing amphorae. I obtained a contract for my PhD and I studied the Corduban region. After its defense in 2020, I have just published it as a book with the University of Barcelona press (2023, Col·leciò Instrumenta, nº 84).

Today, with the completion of the OLEASTRO project (LabEx Archimède) we can consider the Guadalquivir valley as the best-known amphora-producing area in the Roman West. It is the perfect place to study the aspects that linked the world of amphora production to trans-Mediterranean trade and the agricultural system that generated the surplus production necessary for it.

As an archaeologist and a historian, I am interested in problematics surrounding the exportation of roman goods from production areas in the Western Mediterranean Sea. Following an approach based on methods combining field surveys and excavations, I' ve focused on the production of Baetican olive oil, as a representative element of state supply and trans-Mediterranean commercial systems. The potential for studies on pottery workshops in rural Hispania and in other regions, as well as the interaction between producers and consumers are areas of interest for my research.

In the future, I would like to develop two main lines of research in this field. The first will be to continue the in-depth study of the Baetican case, in which the advances made in recent years, allow for an extremely high degree of resolution. Secondly, to begin applying the methods tested and modelled in Baetica to other areas of the Roman Mediterranean.

**Resumen del Currículum Vitae:**

I completed my PhD in 2020 at the University of Paul Valéry Montpellier 3 with a doctoral contract funded by Labex Archimède (CNRS, ANR, Ministry of France). It was cotutelled by the University of Córdoba (Spain), with International  and European mention as well as the Extraordinary Doctorate Award in 2022. I occupied two positions as a post-doctorate : one at the University of Sevilla (Margarita Salas Grant) (1 year, 2022) and the current one at the University of Barcelone (Juan de la Cierva-F Grant) (2023). I have also worked for the University of Toulouse (adjunct professor) and for the CNRS (France) as an engineer.

I have published 18 scientific works: one book and 17 articles. Seven of the articles are in indexed journals (4 in Q1, 2 in Q3 and 1 in Q4), in some of the most prestigious antiquity journals (Journal of Roman Archaeology, Antiquity, Oxford journal of Archaeology, Zephyrus, Mélanges de la Casa de Velázquez...) 6 times as first author.  I have also published three articles in non-indexed journals, seven book chapters, and participated in national and international conference proceedings. I have also written 7 scientific reports for institutions. I have presented my research in public on 26 occasions (20 in international congresses, 12 as first author, in collaboration with 23 different researchers from 8 different institutions).

I have discovered and presented new data relevant to my area of research: the oldest remains of oil amphorae kilns in Baetica, the oldest production stamps on oil amphorae in the Guadalquivir Valley, and the largest excavated pottery production center in the Baetican province. I have recently published my doctoral thesis, with the University of Barcelona Press. With a catalogue of 2076 pottery stamps, in which 80% of which (1712) are new, subsequently the epigraphic corpus of oil amphora producers collected up until 2016 and since the beginning of the discipline in s. XIX by H. Dressel, has since been doubled in 4 years through my research. My most relevant contribution has recently been published in the Antiquity journal and it consists of the proposal of a new methodology to understand and assess the commercial trends of products. I have been able to evaluate the export of olive oil in Roman times (absolute and not relative, as it was traditionally made from consumption centers) for the whole production period in Baetica, the main exporter of the Roman Empire.

My research has been disseminated in more than 90 media in the world, some of the most importants in Spain (El País, El Mundo), the UK (The Guardian) and Italy (Repubblica). I have been curator for two museums and I have held conferences of pop-science about my research in several cultural venues. I have also included young audiences in my scientific projects  and collaborated with local companies to develop new methodologies. I have also peer-reviewed research articles for the journal SPAL (2022) and for the journal Indice Histórico Español (2023).

**Área Temática:** Estudios del pasado: historia y arqueología
**Nombre:** IBÁÑEZ BONILLO, PABLO
**Referencia:** RYC2023-042516-I
**Correo Electrónico:** panamsb@hotmail.com
**Título:** El espacio amazónico en los imperios ibéricos: Territorialidades, Paisajes y Pueblos Indígenas (siglos XVI-XVIII)

**Resumen de la Memoria:**

La trayectoria investigadora del candidato ha estado dedicada desde su inicio al estudio de la experiencia ibérica en América, la historia de la región amazónica y las poblaciones indígenas. Estos elementos han demandado una alta movilidad internacional al candidato, el cual se formó en un programa de máster y doctorado en España, realizó una cotutela internacional en Reino Unido, fue becario posdoctoral en Brasil y trabaja actualmente como investigador en Portugal. Como resultado, sus investigaciones han procurado un abordaje transnacional de la Amazonia, poniendo en diálogo fuentes primarias y secundarias de las Américas española y portuguesa. De la misma manera, el investigador ha tenido que desarrollar una trayectoria multidisciplinar para facilitar sus estudios sobre la historia de las poblaciones indígenas, combinando métodos de las disciplinas histórica y antropológica, en las cuales se formó durante su doctorado. Junto con la historia indígena, otro de sus objetivos ha sido la elaboración de una historia social que incorpore al conjunto de actores históricos, superando visiones historiográficas tradicionales. Los resultados pueden verse en sus investigaciones publicadas, desde la publicación de su tesis de maestría en Bolivia (2011) hasta la publicación de sus últimas investigaciones en la Revista de Indias (CSIC, 2023). Las inquietudes del investigador pueden apreciarse en otros aspectos de su trayectoria, como su liderazgo en un proyecto europeo sobre saberes indígenas, tanto pasados como presentes, y sus posibles intersecciones con otras formas de saber.

La línea de investigación principal que ha desarrollado en estos trabajos y que propone seguir desarrollando se centra en el estudio del espacio amazónico en los imperios ibéricos: territorialidades, paisajes y pueblos indígenas (siglos XVI-XVIII). Estos elementos convergen en una línea de investigación reconocible desde los primeros trabajos del candidato, centrándose en el análisis de las relaciones sociales en el pasado amazónico, a fin de comprender la configuración histórica de un territorio que hoy juega un papel decisivo en el plano internacional. El papel de las poblaciones indígenas, pero también mestizas y afrodescendientes, ha ocupado un lugar central en sus estudios, donde se presta especial atención a las formas de resistencia y a las formas de socialización en las fronteras. El investigador presta especial atención a la relación de las poblaciones con el territorio y el ambiente, en la construcción de una historia humana de la Amazonía. Su intención, por otra parte, es extrapolar sus hipótesis, métodos y objetivos a otros escenarios americanos. Finalmente, el investigador espera iniciar una nueva y complementaria línea de investigación centrada en el estudio de los saberes indígenas en las universidades coloniales en la América española. En ese sentido, su liderazgo del proyecto europeo EDGES será de fundamental importancia, ya que además de desarrollar sus líneas de investigación, podrá poner éstas en diálogo con otros entornos y periodos cronológicos. También la participación de investigadores indígenas en EDGES permitirá la exploración de nuevas metodologías colaborativas en el estudio de sus temas de interés.

**Resumen del Currículum Vitae:**

El candidato es investigador contratado en el CHAM – Centro de Humanidades de la Universidade Nova de Lisboa desde febrero de 2019. Desde 2021 es también uno de los subdirectores del CHAM y coordinador de los Seminarios Permanentes en Estudios Amazónicos y Mundos Indígenas. Es Investigador Principal (IP) de la institución coordinadora del proyecto "EDGES: Entangling Indigenous Knowledges in Universities" (Marie Curie - Staff Exchanges 2024-2027, ID: 101130077). EDGES cuenta con la participación de alrededor de 150 investigadores integrados en 18 universidades, con una financiación de 1.389.000 euros. Ibáñez Bonillo es también investigador de un proyecto Marie Curie - RISE 2019-2024, coordinado por la Universidad Autónoma de Madrid y la Casa Velázquez ("FAILURE: Reversing the Genealogies of Unsuccess, 16th-19th Centuries". H2020-MSCA-RISE, ID: 823998). La experiencia de participación en este proyecto europeo se ha traducido en la realización de dos estancias de investigación en Perú y una en México. Dichas estancias refuerzan un perfil marcadamente internacional desde las primeras etapas de su formación. Ibáñez Bonillo cursó el Máster en Historia de América Latina. Mundos Indígenas, en la Universidad Pablo de Olavide (Sevilla). Su tesis de maestría, sobre la conquista española en la Amazonia boliviana, fue publicada en el año 2011 en Bolivia. A raíz de dicha publicación, el candidato ganó una beca de la Santander Foundation en el Reino Unido y una invitación para cursar el doctorado en la University of Saint Andrews (Reino Unido). Finalmente, optó por una forma de conciliar ambas instituciones a través de un acuerdo de cotutela, por lo que su título de doctorado fue reconocido oficialmente por ambas universidades en 2016. Durante ese mismo año se dedicó a la creación de un Centro de Estudios Amazónicos en la triple frontera entre Perú, Bolivia y Brasil, proyecto financiado por la Agencia de Cooperación andaluza y en el ámbito del cual realizó cuatro misiones en la región. En el primer trimestre de 2017 ganó una beca posdoctoral de cuatro años de duración, ofrecida por el Programa Nacional de Posdoctorado en Brasil, siendo integrado como investigador y docente en la Universidade Federal do Pará. Se incorporó en el mes de mayo de 2017 y permaneció en la institución brasileña hasta enero de 2019. Durante su estancia se dedicó a la docencia en la licenciatura de Historia y en el programa de doctorado, además de realizar investigación en los archivos locales. El producto de sus investigaciones ha sido publicado en varias revistas brasileñas, así como en la prestigiosa revista Ethnohistory, de Estados Unidos. Miembro de cuatro equipos de investigación, desarrolló en coautoría la entrada sobre 'Amazonia Colonial' para la Oxford Research Encyclopedia of Latin America. La calidad y alcance de sus publicaciones contribuyó a que en 2019 ganara una plaza de investigador en concurso abierto competitivo de la Fundação da Ciência e Tecnologia (FCT) en Portugal. Ha publicado varios artículos en las principales revistas de su especialidad en España, Brasil, Estados Unidos y Canadá. Es co-editor de Fronteras en lucha: Guerra y reforma en los imperios ibéricos (1750-1783) (Sílex, 2003). Ha sido editor (2014-2022) y co-director (2022-2023) de la revista Americanía, editada por la Universidad Pablo de Olavide e indexada en SCOPUS.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | PRIORELLI , GIORGIA |
| **Referencia:** | RYC2023-042966-I |
| **Correo Electrónico:** | giorgia.priorelli@udg.edu |
| **Título:** | Political and cultural history of fascism |

**Resumen de la Memoria:**

Centred in European modern and contemporary history, I am a specialist in fascist studies and refugee studies. My work has spanned 3 main thematic areas. My longest research interest since my PhD is the political, intellectual and cultural history of fascism in the interwar period. I have been investigating the fascist conceptual elaboration of the idea of the nation, its evolution over time and the concrete implications that it had in terms of political practice and cultural manifestations. More recently (2020-present), I have expanded my field of research to include forced migrations originating from the outbreak of conflicts and the repressive politics of authoritarian regimes, with an interest in linking past and present experiences of refuge. Gaining experience as a member of an H2020 project based on a multidisciplinary team from humanities and social sciences, I have addressed this topic using an analytical approach employing concepts and tools from history and political science. My third line of research – which crosswise embraces the first two – concerns the reflection on an integrated research methodology that combines political history and political science, to be used to better understand contemporary political phenomena. Epistemology- and methodology-wise, I have focused on Southern Europe, selecting Italy and Spain as case studies. I have blended comparative analysis, multi- and interdisciplinary approaches.

In a future perspective, my interest rests in further developing the study of the political and cultural aspects of fascism using a transnational approach, which analyses how fascist political ideas and principles travelled in space and time and how they readapted in new contexts. To this aim, I will examine the Italian Institutes of Culture abroad (IICs), created by Mussolini's regime as a tool to spread the Fascist version of 'Italianità' in the world. These institutes survived after 1945, being recovered by the Italian republican governments with major modifications. This new research will focus on the IICs in Spain in the period 1930s-1950s. It will explore the activities and the management of these institutes, also stressing how they changed according to the political-institutional transformations that affected Spain after Franco's rise to power and Italy after the fall of Fascism and the birth of the democratic Republic. In so doing, this research reflects on the cultural transfers and political relations between the two countries in crucial periods of their national history, as well as European and world history.

**Resumen del Currículum Vitae:**

I am an early career historian with an international, multi- and interdisciplinarity academic trajectory and a good record of publications and academic events organisation. I obtained a M.A. in International Relations (experimental thesis in Contemporary History) in 2010, and a second-level professional master's degree in 'Parliament and Public Policy' in 2011. In 2013, I won a 'Leonardo Da Vinci Programme' scholarship for young researchers, funded by the European Commission. In October 2014, I began my PhD in 'Political Theory, Political Science and Political History' at LUISS Guido Carli, having won a competitive fellowship (61.813€). After discussing my viva in June 2018 (International Mention), I started to collaborate as an associate fellow within the Political History research cluster at ICEDD. In 2020, I was awarded a H2020 postdoctoral fellowship (24.272€) at the History Department-Universitat Autónoma de Barcelona within the H2020 project SO-CLOSE. In 2021, I worked as a research assistant for the H2020 project EUDIC at the European University Institute. Since March 2022, I hold a 'Maria Zambrano' postdoctoral fellowship (103.500€) at the History Department-Universitat de Girona. Recently, I was awarded a 'Beatriu de Pinós' postdoctoral fellowship (148.906€), which I will start in April 2024. I have been a visiting fellow in prestigious research centres: the Università di Bologna, the Universitat Autònoma de Barcelona, the European University Institute (selected fellow), Durham University and the IMT School for Advanced Studies, for a total of 29 months. In September 2024, I will be a visiting scholar at The New School in New York.

Over the years, I have disseminated my research results nationally and internationally, thus gaining a foothold in my area of knowledge and weaving a dense international network of collaborations. I have published 1 monograph (single author; in SPI), 2 edited volumes (both as co-editor; in SPI), 8 articles (7 as a single author;4 JCR, 1 SCOPUS), 8 book chapters (4 as a single author; 7 in SPI), 3 book review, 1 academic blog article by Cambridge University Press and 1 contribution in the exhibition catalogue of a museum. I have presented my research at 26 conferences and workshops (17 internationals, 9 nationals). I have organised 13 academic events: 6 conferences (4 international,2 national), 3 seminars (2 international,1 national) and 4 panels (2 international,2 national). I have taught at bachelor and master levels at the Universitat de Girona and LUISS (teaching in English). In recognition of the value of my academic contribution, I have been invited to deliver 16 lectures at conferences and workshops (9 international, 7 national). I have been a team member of 10 research projects (5 international, 5 national) and the supervisor of 3 MA theses and 1 BA thesis. Since 2023, I am a Book Review Editor for Modern Italy (CUP). I am a member of the Editorial Committee of the academic journal Spagna Contemporanea, as well as an external reviewer for Routledge and the academic journals Segle XX. Revista catalana d'història and Locus: revista de història. Additionally, I am a member of the Executive Committee of the academic network 'Direitas, História e Memória'. In 2021, I received the Spanish accreditation as 'Profesora Ayudante Doctora' by ANECA and the Catalan accreditation as 'Lector' by AQU in 2023.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | ROSSO HERRERO, DANIELA EUGENIA |
| **Referencia:** | RYC2023-045492-I |
| **Correo Electrónico:** | daniela.rosso@hotmail.com |
| **Título:** | The use of colour in Palaeolithic societies: retracing cultural trajectories of past populations |

**Resumen de la Memoria:**

With a Bachelor's Degree in History, two Master's degrees (Prehistory and Translation Studies), and a PhD (Cum Laude) obtained at the Univ. de Barcelona and the Univ. de Bordeaux (joint doctorate), the candidate has acquired skills in different fields, from Archaeology, to Ethnology and Geology. She began her specialisation in the study of complex cultures and the origin of art during her Master's degree, her PhD, and in stays in internationally recognised research centres. She also developed her research from an archaeometric perspective, by receiving training in cutting-edge technologies for the analysis of ochre, including chemical analyses for the characterisation of raw material, surface texture analysis, 3D modelling techniques and particle size analysis.

In 2018 she received the l'Oréal-UNESCO postdoctoral grant at the Univ. di Ferrara (Italy), where she conducted research on ochre use in Italian Middle and Upper Palaeolithic sites. In 2019 she held the Fyssen Foundation postdoctoral grant at the Univ. Côte d'Azur (CNRS, France), where she focused on the first evidence for the use of colour in Africa and Europe, dated to the Early/Middle Stone Age, and Lower/Middle Palaeolithic. The earliest evidence of ochre use found in Asia has also been part of her research. Since 2020, the candidate is a postdoctoral researcher at the Univ. de Valencia (Juan de la Cierva-Formación grant and APOSTD-Generalitat Valenciana postdoctoral grant), where she is studying ochre use in Upper Palaeolithic key sites from the Mediterranean façade of the Iberian Peninsula.

The candidate's line of research contributes to the debate on the origin and development of complex cultures, through the systematic and systemic analysis of ochre use in Palaeolithic sites from different geographical contexts. The use of ochre is one of the few cultural traits that allows to identify and reconstruct in detail evolutionary and cultural trajectories of human populations from the Lower Palaeolithic to the present day. By analysing this feature over long periods of time, the candidate brings new essential data to our understanding of how and why this cultural trait appeared at different times and in various regions of the world among different human populations, and to what extent it can become an indicator of cognitive complexity. Research conducted by the candidate has been published in high impact publications (Scientific reports, PLOS ONE, J. of Anthropological Sciences, Quaternary International as first author, and Science and Nature as co-author) and presented at international conferences.

The interdisciplinary nature of the candidate's research has allowed her to obtain funding, establish collaborations with various prestigious centres and participate in national and international competitive projects, as principal investigator or researcher in charge of ochre analysis, in which lines of various fields of study converge (Archaeometry, Ethnoarchaeology, Geology, Archaeology…). The long-term collaborations she established with different research centres allowed her to have full access to the necessary equipment to conduct her research. At present, the candidate has the necessary skills to lead her research line independently, to fully design interdisciplinary analytical protocols for the analysis of ochre, and develop the interpretative aspects of her research.

**Resumen del Currículum Vitae:**

The candidate completed her Bachelor's Degree at the Univ. of Salamanca and two Master's Degrees (Biological Anthropology-Prehistory, Univ. de Bordeaux; Translation Studies, Univ. Pompeu Fabra). She obtained her Doctoral degree (cum laude) in the framework of a joint PhD (Univ. Barcelona / Univ. Bordeaux).

During her PhD, she was part of world-renowned international teams (SERP and PACEA). She obtained predoctoral competitive scholarships: Eiffel excellence scholarship (French Ministry of Foreign Affairs), Martine Aublet Foundation grant (Musée du Quai Branly), Dissertation Fieldwork Grant (Wenner-Gren Foundation) and FI-DGR scholarship (Generalitat de Catalunya).

Her postdoctoral research has allowed her to join different research teams: the Univ. di Ferrara (supervised by M. Peresani, funded by the l'Oréal-UNESCO For Women in Science Scholarship), the Univ. Côte d'Azur, CEPAM, CNRS (supervised by M. Regert, funded by the Fyssen Foundation), and the Univ. de Valencia (supervised by V. Villaverde, funded by the Juan de la Cierva-Formación and APOSTD-Generalitat valenciana scholarships).

Her work focuses on the emergence and evolution of complex cultures. Her main objective is to systematically analyse the use of colour from Lower Palaeolithic/Early Stone Age to Upper Palaeolithic/Later Stone Age contexts in Europe and Africa. This will allow to understand how the use of colour emerged and evolved through time and to retrace the cultural paths followed by human populations towards cognitive complexity.

She has established collaborations with excellence research organisations in Spain, Italy, France, Germany, Portugal, South Africa and China. She is a team member of national and international competitive projects where she was either principal investigator or has led the ochre analysis research line. This has allowed her to acquire skills in different fields, from archaeology, to mineralogy and geology. She received training in cutting-edge techniques used for the analysis of ochre (elemental and mineralogical characterisation, surface texture analysis, three-dimensional modelling techniques, laser granulometry…) that she combined with morphometric and technological observations. She is fully qualified to develop the technical and interpretative aspects of her research.

Her results were published in peer-reviewed journals (Scientific rep., PLOS ONE, J. of Anthropol. Sciences, Quat. Int., as first author, and Science and Nature as co-author) that were cited 249 times (Google Scholar), presented at various international conferences, often upon invitation, and highlighted by the press. She has obtained funding for her research, reviewed papers for high-impact journals and congress proceedings, and is organiser of a session in an international conference.

She has been a scientific advisor for exhibitions and has given talks for the general public. Her fluent knowledge of languages and training as a translator have been an advantage for the dissemination of results. She gained teaching expertise by giving official lectures at the Univ. de Barcelona and Valencia and punctual lectures at the Univ. Bordeaux, Univ. Bordeaux-Montaigne and Univ. Côte d'Azur. She coordinates Archaeology seminars for PhD candidates at the Univ. de Valencia, received training courses aimed at improving teaching skills and is a member of teaching innovation projects.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Estudios del pasado: historia y arqueología
**Nombre:** OTTATI , ADALBERTO
**Referencia:** RYC2023-042808-I
**Correo Electrónico:** adalberto.ottati@gmail.com
**Título:** Experimentación y soluciones constructivas innovadoras en la arquitectura romana.

**Resumen de la Memoria:**

Mi principal línea de investigación es la organización, las técnicas y la tecnología en la arquitectura antigua y se incluye en la disciplina denominada Arqueología de la Construcción. El objetivo es ampliar el estudio sobre las dinámicas de diseño y organización del proyecto arquitectónico, así como el papel de los talleres encargados de la construcción en las provincias romanas tanto del Mediterráneo occidental como oriental, con las evidencias relacionadas a la capacidad de experimentar de los talleres romanos. Mediante el análisis combinado del estudio del proyecto antiguo y de las técnicas constructivas empleadas en los edificios quiero realizar un análisis crítico para aproximarnos a la comprensión de la capacidad que arquitectos y artesanos romanos poseían para resolver problemas técnicos, experimentar y producir innovación en la arquitectura. Con la finalidad de alcanzar mi objetivo principal me centraré en la arquitectura del siglo II d.C. analizando la evolución formal y funcional de los espacios edificados y el uso consciente de las tecnologías, encaminado a mejorar su usabilidad, la estabilidad estructural y el proceso de construcción ¿Cómo afrontar el reto que representa la construcción? ¿Cómo superar las dificultades que impone el terreno, la resistencia de los materiales, el tiempo de construcción, las dificultades de abastecimiento? A menudo, los problemas se resolvían explotando adecuadamente lo que el entorno y la naturaleza ponían a disposición, y los conocimientos de los maestros de obras, mediante un proceso experimental. Mi focus será el periodo comprendido entre los emperadores romanos Trajano y Cómodo (98-193 d.C.), en el que se construyeron muchos de los edificios más emblemáticos de la arquitectura romana. La cantidad de construcciones nuevas y recursos disponibles fomentó la búsqueda de la innovación, utilizada como significante ideológico. La calidad de la construcción romana alcanzó su nivel máximo, con técnicas constructivas y de ingeniería extremadamente innovadoras y eficaces, universalmente reconocidas como fundamentales para la evolución de la arquitectura occidental. De hecho, el siglo II fue el laboratorio en el que se concibieron las pautas de la arquitectura tardoantigua, bizantina y medieval, y del que se nutriría el Renacimiento para sus creaciones barrocas. Los posibles resultados de mi investigación pueden generar una conexión entre los procesos de construcción en el mundo clásico y en la arquitectura sostenible en general: la experimentación y la innovación en la construcción, la adaptación al territorio, los cambios en los patrones de consumo con la consiguiente creciente escasez o abundancia de ciertos materiales, con el uso razonablemente de éstos, traen consigo no sólo nuevas tecnologías, sino también nuevas ideas. La capacidad de la arquitectura romana para hacer frente a las contingencias bioclimáticas, de resistencia de los materiales y de construcción puede tener un enorme impacto en la ciencia de la construcción actual. Además, La arquitectura es un elemento clave en cualquier cultura, por lo que investigar el sistema de pensamiento de la cultura constructiva de zonas geográficas concretas, aportará importantes conocimientos sobre la sociedad, la economía y la cultura.

**Resumen del Currículum Vitae:**

Tras licenciarme y especializarme en Arqueología en la Universidad La Sapienza (Roma 2006 y 2010) obtuve el doble Doctorado en Arqueología Clásica (URV/La Sapienza 2015). Mi trabajo de Doctorado, financiado por una beca obtenida en concurrencia competitiva (ICAC 2011-2014), supuso la generación de conocimiento de un área inédita de Villa Adriana (Tívoli, Italia): "La Accademia", trabajo que sentó las bases de una investigación que ha tenido una importante repercusión internacional. Mi trayectoria está marcada por una gran movilidad guiada por la adquisición de formación específica vinculada a la Arquitectura romana. Así, a lo largo de mi doctorado, tuve la oportunidad de desarrollar parte de mi investigación en la Universidad de Reading (UK) (2012-2013, 5 meses) y establecer una colaboración internacional con la Scuola Archeologica Italiana di Atene (SAIA) gracias a una beca financiada por la URV (2013-2014, 6 meses). Durante el periodo predoctoral, afiancé mi capacidad de liderazgo a través de la co-dirección, junto a P. Pensabene, de las intervenciones arqueológicas en importantes conjuntos arqueológicos como el Mausoleo de Villa Adriana (La Sapienza 2006-2015) y Villa del Casale (Piazza Armerina, Sicilia, Italia) (2010), trabajos que dieron lugar a artículos de impacto internacional. Tras la obtención del grado de Doctor (2015) disfruté de una beca en la SAIA (Atenas 2015, 9 meses), siendo galardonado con el premio "Elena Rossi". Esta estancia me permitió ahondar en cuestiones relacionadas con la Arquitectura del Oriente Mediterráneo. Continuando con el evidente carácter internacional que ha marcado mi trayectoria, he sido becario en el Instituto Arqueológico Alemán de Berlín (2017) a través de la obtención de 3 becas postdoctorales, 2 otorgadas por el propio DAI y 1 por el Servicio Alemán de Intercambio Académico (DAAD). De 2018 a 2019 fui contratado Juan de la Cierva Formación en la Universidad Pablo de Olavide. En el marco de este contrato, puse en práctica mi red de contactos y mi capacidad para trabajar en un equipo internacional con mi participación como investigador en proyectos de I+D+i. En este periodo se enmarca la organización de un panel en el congreso AIAC (Bonn, 2018) y la publicación de una obra colectiva dedicada a los talleres edilicios en época imperial. En 2019 obtuve el contrato de excelencia Marie Curie Action que desarrollé en el Trinity College de Dublín (2019-2021). El proyecto de investigación me permitió investigar las técnicas de construcción e ingeniería utilizadas en la construcción de Villa Adriana, dando lugar a una monografía (2022). En los últimos años he continuado mi principal línea de investigación: la organización, técnicas y tecnología en la arquitectura antigua, a la que he dedicado 2 volúmenes del que soy co-editor (2020-21). Asimismo he coordinado un volumen sobre palacios imperiales(2022) y co-organizado la reunión científica internacional "La cantera y el monumento 2" (UNED, Segovia 2023). En el ámbito docente, imparto cinco asignaturas en el Grado como profesor Ayte. Doctor (desde 2021) y soy profesor en el título de experto 'Arqueología de la Arquitectura clásica', de la UPO y en el curso de Formación Permanente en "Iniciación a la Arqueología de la Construcción" de la UNED. He sido IP de un proyecto Innovación Docente de la UPO. He dirigido 2 TFM. Estoy acreditado como Profesor Titular (Sistema Científico Nacional Italiano (08/06/2022) y como Profesor Contratado Doctor (ANECA, 12/09/2022)

**Resumen de la Memoria:**

Alan Granadino holds a PhD in History and Civilization from the European University Institute, where in 2016 he defended the thesis "Democratic Socialism or Social Democracy? The Influence of the British Labour Party and the Parti Socialiste français in the Ideological Transformation of the Partido Socialista Português and the Partido Socialista Obrero Español in the mid-1970s." After defending the thesis, he has been on paternity leave on two occasions. During this period, Granadino has worked part-time, being a postdoctoral researcher at the Historical Archive of the European Union and coordinator of the North and South in European Mental Map network at the Centre for Nordic Studies at the University of Helsinki. He has also been Adjunct Professor at the University of Helsinki, where he taught the course "Ibero-American Culture in the 20th Century" in 2017 and 2019. In addition, Granadino was a recipient of the Research Grant on Christian Democracy and European Integration 2016 Edition at the Historical Archives of the European Union. Since September 2019, Granadino has worked full-time as a postdoctoral researcher at the University of Tampere (Finland). Granadino was also member of a project to organize a series of witness seminars that collect the experiences of politicians active in the 70s, 80s and 90s in northern and southern Europe. Granadino has published scientific articles in peer-reviewed journals with a high impact index, both Spanish and international. In addition, he has published and edited several books in Spanish and English, some of them with prestigious international publishers such as Routledge and Palgrave.

His research focuses on three interrelated areas: 1. the transnational networks of social democracy and European Christian democracy in the context of the transitions to democracy in the Iberian Peninsula and Cold War détente. 2. Neutralist tendencies in the contemporary history of Spanish foreign policy, 3. Visions of Europe existing in Northern and Southern Europe from the 1970s to the 1990s. In his research he draws inspiration from, and makes use of, innovative theories and methods of analysis, such as transnational history, comparative history, cultural transfer theory, conceptual history, and global history.

The line of research on which I have started working is focused on the peripheries of Europe. It is far from being exhausted. Therefore, the lines of research that I propose are linked to the research that I have been conducting in the last year but are new, more ambitious, in their scope. My project has a twofold aim.

The first aim is to investigate and foment investigation on the visions of Europe and its role in the world conceived in Northern, Southern and Eastern Europe between the 1950s and the 1990s.

The second aim is to investigate how different social actors in Northern and Southern Europe – decision makers, media and citizens – interpreted, experienced and responded to two sets of contemporary crises in Europe. First, economic and social crises, such as the 1973-1979 oil crises, the 1992-1993 economic crisis. Second, security and geopolitical crises, such as the 1982-1985 euromissile crisis.

**Resumen del Currículum Vitae:**

Alan Granadino holds a PhD in History and Civilization from the European University Institute, where in 2016 he defended the thesis "Democratic Socialism or Social Democracy? The Influence of the British Labour Party and the Parti Socialiste français in the Ideological Transformation of the Partido Socialista Português and the Partido Socialista Obrero Español in the mid-1970s." After defending the thesis, he has been on paternity leave on two occasions. During this period, Granadino has worked part-time, being a postdoctoral researcher at the Historical Archive of the European Union and coordinator of the North and South in European Mental Map network at the Centre for Nordic Studies at the University of Helsinki. He has also been Adjunct Professor at the University of Helsinki, where he taught the course "Ibero-American Culture in the 20th Century" in 2017 and 2019. In addition, Granadino was a recipient of the Research Grant on Christian Democracy and European Integration 2016 Edition at the Historical Archives of the European Union. Since September 2019, Granadino has worked full-time as a postdoctoral researcher at the University of Tampere (Finland). Granadino was also member of a project to organize a series of witness seminars that collect the experiences of politicians active in the 70s, 80s and 90s in northern and southern Europe. Granadino has published scientific articles in peer-reviewed journals with a high impact index, both Spanish and international. In addition, he has published and edited several books in Spanish and English, some of them with prestigious international publishers such as Routledge and Palgrave.

His research focuses on three interrelated areas: 1. the transnational networks of social democracy and European Christian democracy in the context of the transitions to democracy in the Iberian Peninsula and Cold War détente. 2. Neutralist tendencies in the contemporary history of Spanish foreign policy, 3. Visions of Europe existing in Northern and Southern Europe from the 1970s to the 1990s. In his research he draws inspiration from, and makes use of, innovative theories and methods of analysis, such as transnational history, comparative history, cultural transfer theory, conceptual history, and global history.

**Resumen de la Memoria:**

My main scientific interest lies in understanding the challenges and innovations that led to the first development of sedentism, agriculture and animal domestication. I approach this research goal from an interdisciplinary perspective, using multiscalar geoarchaeological methods to answer questions on human-animal-environment dynamics and explore issues related to the ecological adaptations, concepts of space, health conditions and dietary patterns of the earliest village communities. My multi-proxy geoarchaeological approach comprises the integration of: 1) soil micromorphology, 2) elemental characterisations through XRF, XRD, FTIR and SEM-EDX techniques, 3) lipid compound analysis and 4) plant and dung microfossil analysis. In the next phase of my career, I plan to focus on examining site biographies through the use of microscopic and biomolecular approaches (DNA, proteins and lipids), targeting organic residues in their exact depositional contexts and advancing the archaeological interpretation of anthropogenic deposits.

The aim of my current line of research is to explore the constitution of open spaces to investigate how the earliest sedentarising an sustained sedentary communities operated at supra-household levels and engaged with the environment. Settlement open areas played a vital socio-economic role as the loci of discard practices, outdoor activities, and human-animal-environment interactions. However, while built environments are a recurrent research theme for this period, open spaces remain less studied. This oversight is partly due to the methodological and interpretative problems posed by open areas, often displaying comple stratigraphies consisting of superimposed microlayers and excavated in arbitrary units that do not represent units o deposition. Specifically, I am currently aiming: 1) to develop a new multiscalar and interdisciplinary methodology for an improved identification of microscopic and molecular residues of organic nature in open sequences; 2) to characterise the variety of formation and taphonomic processes affecting open areas; and 3) to provide a wide diachronic and geographical understanding of the concepts and transformations of open spaces and the socio-cultural aspects related to their use.

My research focuses on early Holocene semi-mobile and sedentary communities in the Near East (Turkey, Jordan and Iraq), one of the core areas of the Neolithic Transition. Through a multi-proxy methodological approach that combines spatial analyses, geoarchaeology, plant science, molecular and lipid analyses and ethnoarchaeology, my research explores the heterogeneity of the earliest settlement open areas, opening up a much-needed comparative path for the examination of local trajectories in their creation, transformation and use and contributing new insights into the rise and evolution of anthropogenic landscapes and ecologies.

**Resumen del Currículum Vitae:**

I am currently a Postdoctoral Marie Sklodowska-Curie Individual Fellow at the Milá y Fontanals Institute for Humanities Research, Spanish National Research Council, where I am carrying out my research project PATIOS: Life between houses – a multiscalar interdisciplinary investigation into the creation and use of settlement open spaces by the first sedentary communities (MSCA-IF-2020- 101031925). Immediately before, I worked in research within the private sector, conducting multiple projects as Geoarchaeological Officer for Headland Archaeology (UK), part of the RSK Global Group that integrates environmental, heritage, and construction engineering services. In 2020 I was awarded a highly competitive Research Fellowship by the German Archaeological Institute and, in 2019, I held the prestigious John Wainwright Early Career Fellowship in Near Eastern Studies at the University of Oxford.

I completed my PhD in 2017, fully funded by the Arts and Humanities Research Council (AHRC), at the University of Reading (UK), followed by a Postdoctoral Research Assistant position at the same university. During my doctoral studies, I was awarded a Junior Research Fellowship at Koç University (Turkey), which led me to spend nine months at the Research Center for Anatolian Civilizations (ANAMED) in Istanbul.

To date my scientific production has resulted in the publication of 5 peer-reviewed journal articles (+3 under revision), 10 book chapters (+2 under revision), 1 conference proceedings and 4 technical reports. I have organised one 3-day seminar/workshop on residue analysis and two international conferences, and I am currently in the organising committee of three more. I have presented 31 international conference communications and have delivered 9 invited talks in leading international conferences and seminars.

Throughout my career, I have shown an excellent ability to generate ideas that have won highly competitive research grants from international funding bodies, including MSCA, NERC, AHRC, and BIAA, reaching a total of ca. 400,000€ combined income. These awards have allowed me to coordinate several research projects, collaborating with a broad variety of researchers in different disciplines and countries, and mentoring students. In addition, I have participated as a geoarchaeological researcher in 6 high profile international research projects (2 currently ongoing), including two John Templeton Foundation Grants. Since 2023, I am an elected member (Prize Administrator) of the Managing Committee of the International Association for Environmental Archaeology (AEA).

I have undertaken extensive research in the private sector (Headland Archaeology), conducting multiple geoarchaeological projects as team leader throughout the UK, and transferring scientific results to public organisations and governmental end-users. My profound commitment to scientific dissemination is demonstrated by my contributions to museum talks and exhibitions, site visits, school workshops, blogs, educational videos and participation in science festivals. In 2023, my MSCA project was selected by the European Commission to be showcased at the annual Science is Wonderful! Fair, focused on engagement activities with pupils and citizens in Brussels.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | ORSINGHER , ADRIANO |
| **Referencia:** | RYC2023-045412-I |
| **Correo Electrónico:** | adriano.orsingher@gmail.com |
| **Título:** | The archaeology of social and ritual practices in the Phoenician/Punic Mediterranean |

**Resumen de la Memoria:**

I am an archaeologist leading research on the Phoenician/Punic Mediterranean, with a special focus on ritual and social practices in contexts of mobility and migration by adopting an interdisciplinary, comparative and anthropologically informed perspective. I have developed these lines of research since my MA thesis on Iron Age Cyprus, where I challenged traditional paradigms on times, modes and effects of the Phoenician presence in Cyprus by applying a post-colonial perspective and focusing on social and ritual practices resulting from cross-cultural contacts between Phoenicians and Cypriots. In my PhD dissertation (2013), I applied this conceptual framework by exploring the ritual practices of the Tophet sanctuary of Motya as they emerged from the full analysis of the cinerary urns from this 8th-4th century BC open-air sacred area in Sicily. My postdoctoral experience at Oxford (2013/14) allowed me to put this research into a wider framework by exploring child sacrifice and the archaeology of childhood and religion. Also, I started the interdisciplinary study of ancient masks, which constitutes a pivotal axis of my research agenda. Within the projects on masking phenomena, I carried out at Oxford, Bochum and Tübingen Universities (2016/18), I promoted a new theory interpreting Phoenician/Punic masks by linking superhuman beings and age groups, outlining the role of emotions, body movements and sound in the disguised experiences, emphasising the significant contribution of Carthage in the making of new mask genres and strengthening of the religious Mediterranean networks. While tackling these scientific questions, Tübingen University also fostered my teaching skills and enlarged my research agenda. During 2018/21, I obtained several postdoctoral contracts to work on the project "The Land Flowing with Milk and Honey". Development and Significance of Agrarian Resources in Bronze and Iron Age Palestine. I led the petrographic study of the plastered installations at Tell el-Burak (Lebanon) resulting in a pivotal article on Phoenician wine production and consumption, and contributed to the study on agricultural practices in Phoenicia and to the volume Kamlah/Riehl (eds) in press. Atlas des Ackerbaus im antiken Palästina, Tübingen.

Since 2021, I have led the multidisciplinary projects "Face Off: Understanding Ancient Masks" at UPF and "Beyond Theatre. Performance, Age and Gender in Phoenician and Punic Masks" at the GRI (2022), which entail a comparative analysis of disguised phenomena in the Iron Age Mediterranean to understand age, gender and emotions in ancient masks. I have demonstrated the pivotal role of age groups in the selection of masks' wearers and intended audiences, and challenged traditional interpretations of how gender is displayed in disguised practices by extending the focus from the face to the entire body and its movements during the performance.

Overall, I have developed a coherent scientific path and acquired a multidisciplinary approach to investigate social and ritual practices in the Phoenician/Punic Mediterranean by focusing on all the human components (with an intersectional perspective on gender and age groups) and considering users and intended audiences, tools, materials, technologies, spaces and sensorial elements. This is the line of research that I intend to explore if I am awarded a Ramón y Cajal contract.

**Resumen del Currículum Vitae:**

I am an Honorary Research Fellow at Tübingen University and a Marie Curie Postdoctoral fellow at Pompeu Fabra University. I lead research on Bronze and Iron Age archaeology, pottery and terracottas. I have 62 publications (i.e., 1 edited book, 42 peer-reviewed articles and book chapters, being 5 of them in Q1, 8 book reviews, 4 scientific articles for the general public, and 7 forthcoming papers) on the 2nd-1st Millennia BC Mediterranean, Phoenician/Punic materialities and ritual and social practices. Currently, I am leading four Iron Age Mediterranean projects funded by the Mediterranean Archaeological Trust, the Gerda Henkel Foundation, the European Union, and the German Society for the Exploration of Palestine ("Motya. Final Report of the excavations carried out by Vincenzo Tusa in the so-called Luogo di Arsione"; "Perfuming the Iron Age Mediterranean. Towards a Comprehension of the 'Phoenician Oil Bottles': Technology, Production Centres and Contents"; "Face Off. Understanding Ancient Masks"; "Towards a Corpus of Phoenician Terracottas in the Iron Age Levant"). In these four projects, I am the Principal investigator and collaborate with several international scholars from different disciplines related to archaeology from various research institutions in Italy, Germany, Spain, Belgium, the UK, and the USA. The main line of research that I have followed since the beginning of my scientific career is to understand Phoenician/Punic mobility, their cultural exchanges with local populations and their social/ritual practices through the study of different materialities (e.g., ceramics, terracottas, stelae), imageries and performances by adopting an inter-disciplinary, comparative and anthropologically-informed perspective. For my doctoral dissertation, I traced the history and ritual practices of the Tophet sanctuary of Motya by analysing the 8th-4th centuries BC pottery from the urnfield of this open-air sacred area in western Sicily.

Due to my postdoctoral mobility in the UK, Germany, Spain and the USA, I have extended my research, initially focused on the Phoenicians in Iron Age Cyprus and Sicily, to the Bronze Age and the entire Mediterranean basin and even beyond it. Accordingly, I have developed a long-term perspective and gained an anthropological and comparative approach in my work, which – through collaborative and multidisciplinary projects – attempts to integrate methodologies and data from various scientific disciplines. This explains the extensive network of collaborations and partnerships I have built, the variety of topics I have widely investigated and published on, but also why I have been invited to give 30 talks in different international institutions, write book reviews in high-impact journals and paid to teach courses at universities on multiple subjects resulting from my past and ongoing research projects and investigations. Also, I have acquired considerable teaching experience in three different countries (i.e., Germany, Italy, and Spain), which combines different methodologies and includes both face-to-face and remote learning. My international credibility is also shown by a successful record in earning funding from several institutions, an aptitude towards publishing in top journals and other high-impact venues, and a frequent role as a peer-reviewer for established journals and publishers.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | FYTILI , MAGDALINI |
| **Referencia:** | RYC2023-044538-I |
| **Correo Electrónico:** | fitilimagda@hotmail.com |
| **Título:** | Politics of Memory, post-transitional justice and forced displacement |

**Resumen de la Memoria:**

One of the researchers' main lines of investigation is the politics of memory, recognition and reparation. The researcher has led, as a Principal Investigator (PORE), an extensive investigation on the subject of the recognition of the National Resistance in Greece in a comparative fashion with Belgium, France, Italy and the Netherlands. See M. Fytili, M. Avgeridis, E. Kouki (2023), "Heroes or Outcasts? The Long Saga of the State's Recognition of the Greek Resistance, 1944–2006", Contemporary European History; M. Fytili (2022), The Second Life of the National Resistance Themelio; M. Fytili (2022), "Including the Nation's Enemies: The Long Politics of Recognition and Restitution during the Third Greek Republic", Journal of Modern Greek Studies. The researcher has continued in-depth her PhD investigation on the politics of memory regarding the legacy of the Civil War and the dictatorship in Greece and Spain through the Horizon 2020 REPAST project. See M. Fytili (2020), "The Past in Today's Political Attitudes and Voting Behaviour: Greece and Spain in Comparative Perspective", European Consortium for Political Research ECPR, August 28, and M. Fytili (2019), "The Re-emergence of Past Conflicts as a Political Issue", Third Annual Conference of the Memory Studies Association, Madrid, Spain, June 27. Currently, she collaborates with the University College of Dublin in the ERC project, "The Age of Civil Wars in Europe, c. 1914-1949" for publishing a Special Issue on the comparison of the Greek and the Spanish Civil Wars for the international journal Civil Wars. See M. Fytili (2024), "How to Compare Civil Wars: The Spanish and the Greek Civil Wars", Centre for War Studies, University College Dublin, Dublin, 25 of January.The researcher has also made an investigation about Greek-Spanish relations during the 20th Century. See M. Fytili, (2024), "The Impact of the Greek Case on Francoist Spain", Bloomsbury Publishing; M. Fytili (2023), "Disciplinando el gen rojo: discursos y prácticas de depuración en la Grecia de la posguerra civil", Marcial Pons; M. Fytili (2023); and M. Fytili (2022), "La tercera muerte de los brigadistas griegos: historia y memoria de una militancia internacionalista", Historia del Presente. The researcher's second main line is the study of the transition to democracy, principally the Greek and the Spanish cases. See M. Fytili, M. Cardina (2023), "From History to Memory: Representations of Regime Change in Portugal, Spain and Greece", Mélanges de la Casa de Velázquez; M. Fytili, "The Afterlives of Transitional Justice in Spain and Argentina: The Madrid Trial and the Argentine Querella", The International Journal of Transitional Justice; and M. Fytili (2024), "The Semantics of the Transition to Democracy in Greece and Spain", Berghahn Books. The researcher's third line of investigation is the forced displacement during the 20th century with a special emphasis on the configuration of the concept of refugee in post-war Europe (1945-1951). See M. Fytili (2023), "De DPS a refugiados. La configuración del concepto de refugiado en la Europa de posguerra (1945-1951)", Comares; and M. Fytili (2022), "Reverse Displacement: A Mirror of the Past?", Association of Critical Heritage Studies ACHS International Conference, Santiago de Chile, Chile, December 7.

**Resumen del Currículum Vitae:**

The researcher has published, in the last 10 years, 17 scientific articles, 18 book chapters, and two monographs in English, Spanish and Greek, while she has also participated in 24 national and international conferences. The researcher has developed her research activity in different universities and research centres in Spain (UAM, UAB, Complutense University) and Greece (National Hellenic Research Foundation, Hellenic Open University, National and Kapodistrian University of Athens), while she has carried out short research stays at the Université Libre de Bruxelles (ULB) and the Seeger Center for Hellenic Studies at Princeton University. The researcher is a member of "The Resistance Network" (RESNET); a member of the research network "Political A.T.L.A.S., Agency, Transfers, Links"; and a member of the network "Multiperspective Holocaust Remembrance in Contemporary Europe" (MuRem). The researcher has participated in the last 10 years in 12 national (Spanish and Greek) and international research projects; in two of them she has been the Principal Investigator; and four of them are European programmes (Horizon 2020 and ERC). The participation of the researcher as a Principal Investigator in two highly competitive calls/projects (TRANSMEAS and PORE) and as a postdoctoral researcher in multiple national and European research programs, as well as her institutional cooperation with different universities in Greece, Spain, the United Kingdom, Belgium, the United States and currently in Argentina demonstrate a high degree of academic autonomy and a high level of expertise. The researcher has participated/participates in the following research projects: the ERC Consolidated Grant programme MUTE; the European project WIRE; the Spanish projects "Perpetrators. Agencies, Actors and Beneficiaries of Francoist Violence, 1936-52"; POLMEMO; and The Third Spain: Genesis and Public Uses of a Political Concept (1936-2020); the Horizon 2020 SO-CLOSE project; the Horizon 2020 REPAST project; "The Cyprus Archive" of the Greek Parliament; and the Greek national project Greece and Spain during the 20th Century.The researcher is from 2022 a member of the Consolidated Research Group GRECS, Research Group on War, Political Radicalism and Social Conflict of the UAB. From 2022, co-directs one PhD thesis (Complutense University); she supervised one defended in 2022 (Hellenic Open University); and she was the external evaluator of another one (Complutense University). The candidate has received from the National Agency for Quality Assessment and Accreditation of Spain (ANECA) accreditation for the roles of Assistant Doctoral Professor and Contracted Doctoral Lecturer; and from the State Research Agency (AEI) the R3 Certificate of an established researcher (2024).The researcher is a member of the Editorial Committee of the Greek academic journal Tribuna Abierta de Estudios Hispano-Helenos; and an external evaluator for the international and Spanish academic journals, Journal of Modern Greek Studies, Memory Studies Journal, Contemporary European History, Historia del Presente, Historia y Política and Historia, Trabajo y Sociedad. She has also been the evaluator for three international projects.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | GARCÍA CABRERA, MARTA |
| **Referencia:** | RYC2023-043352-I |
| **Correo Electrónico:** | marta.garcia@ulpgc.es |
| **Título:** | Marta García Cabrera- Propaganda e Inteligencia |

**Resumen de la Memoria:**

Marta García Cabrera es Doctora en Historia por las Universidades de Las Palmas de Gran Canaria (ULPGC), La Laguna, Madeira y Azores. Además de ser graduada en Historia por la ULPGC (Premio Extraordinario Fin de Título), es titulada del Máster Oficial en Formación del Profesorado de Educación Secundaria Obligatoria y Bachillerato, Formación Profesional y Enseñanza de Idiomas de la ULPGC (Premio Extraordinario Fin de Máster), así como titulada del Máster Universitario War, Media, and Society de la Universidad de Kent (Reino Unido). Fue investigadora predoctoral en la ULPGC a través de la financiación del Gobierno de Canarias y el FSE. Actualmente es Investigadora Honoraria en la Universidad de Kent (Reino Unido) e Investigadora Postdoctoral en la ULPGC, bajo el programa Margarita Salas. Recientemente ha finalizado una estancia postdoctoral de dos años en la Freie Universität de Berlín (FU), con una gran formación internacional y la colaboración recíproca con un consolidado equipo de Historia Militar y Global. Su principal línea de investigación es el estudio de la propaganda y la inteligencia en los grandes conflictos del siglo XX, dedicando especial atención a su impacto en territorios neutrales como España y, en particular, a la huella dejada en el escenario atlántico (Canarias, Azores, Madeira y Noroeste de África). Su tesis doctoral con Mención Internacional y Premio Extraordinario de Doctorado fue el primer gran estudio comparado de las campañas propagandísticas extranjeras en España durante las guerras mundiales. También es especialmente conocida por sus investigaciones sobre el binomio formado por la propaganda y la neutralidad, con actividades y publicaciones realizadas junto al investigador británico Dr. Edward Corse. Su investigación postdoctoral se centra en el estudio de la actividad secreta desplegada por Gran Bretaña, Estados Unidos y Alemania en España y en el escenario atlántico entre 1939 y 1950. Sus investigaciones revelan el funcionamiento de las redes de inteligencia y contrainteligencia extranjeras en Canarias y el Norte de África, el protagonismo de las comunidades foráneas y el diseño de operaciones de sabotaje en entornos portuarios atlánticos. La candidata no solo es valorada por su análisis sobre el nazismo en Canarias, sino también por sus estudios pioneros sobre la inteligencia y la propaganda operacional, una variante teórica dentro de los estudios sobre propaganda e inteligencia. La investigadora cuenta con la acreditación de Profesor Ayudante Doctor (ANECA) e imparte docencia en la asignatura de Historia Contemporánea Universal en la ULPGC e Historia de la Inteligencia en la Universidad de Santiago de Compostela. Marta García es una de las fundadoras de la Red Española de Estudios Históricos de Inteligencia (RESHINT), que reúne a historiadores nacionales e internacionales de renombre, como Emilio Grandío Seoane y David Messenger, entre otros. La corta, pero activa, trayectoria de Marta García hace que la candidata haya adquirido importantes capacidades científico-técnicas, como su gran formación, colaboración y movilidad internacional, su grado de independencia para la elección y el desarrollo de sus investigaciones, así como el liderazgo mostrado en actividades e investigaciones científicas con equipos nacionales e internacionales.

**Resumen del Currículum Vitae:**

La doctora Marta García Cabrera es conocida por sus investigaciones sobre propaganda e inteligencia en perspectiva histórica, con análisis especialmente centrados en las grandes campañas bélicas del siglo XX. Gran parte de su investigación inicial se dirigió hacia el análisis de la propaganda extranjera en España durante la Primera y la Segunda Guerra Mundial. Así, por ejemplo, es autora del libro Bajo las zarpas del león: persuasión británica en España durante las guerras mundiales, publicado por la prestigiosa editorial Marcial Pons (1 en SPI) en 2022. Además, es autora de varios artículos científicos publicados en revistas de impacto como Vegueta, War & Society, Media History y Pasado y Memoria, entre otras –todas ellas con índices de impacto especialmente destacados, entre el Q1 y Q2 de WOS y SJR–. También ha publicado varios capítulos de libro, como los editados por la prestigiosa editorial británica Routledge. Ha asistido como ponente a multitud de congresos y seminarios repartidos alrededor del mundo, como París, Lovaina, Bødo, Nueva York, Londres y Madrid, entre otros. La candidata es internacionalmente conocida por sus investigaciones inéditas sobre el binomio formado por la propaganda y la neutralidad; algo que ha realizado especialmente junto al investigador británico Edward Corse (Universidad de Kent). Véase, por ejemplo, la organización del Congreso Internacional ' Propaganda and neutrality: alternative battlegrounds and active deflection' , celebrado en 2021 con el respaldo del Institute of Historical Research de Londres y la Universidad de Kent. También es destacable la publicación del libro en coedición Propaganda and Neutrality: Global Case Studies in the 20th Century (Bloomsbury, 2023) que está disponible completamente en Acceso Abierto. La doctora es, además, conocida por sus estudios sobre inteligencia y espionaje, con investigaciones postdoctorales centradas en la actividad secreta desplegada en España y en el escenario atlántico entre 1930 y 1950 –servicios secretos, nazismo, contrainteligencia, sabotaje–. Así, por ejemplo, Marta García cuenta con dos artículos publicados en la revista Intelligence and National Security –la revista de estudios de inteligencia más valorada, con un Q1 en WOS y SJR–, así como un segundo libro de investigación de autoría individual publicado en 2023 por la prestigiosa editorial Dykinson (3 en SPI) bajo el título Deutsche auf den Inseln! La colonia alemana de Canarias y la huella del nazismo (1930-1946). La candidata también ha impartido conferencias y seminarios sobre esta línea de investigación en diferentes eventos científicos de impacto, como los organizados por la Asociación de Historia Contemporánea, la North American Society for Intelligence History (NASIH- en Calgary, Canadá) o la Transatlantic Studies Association. Marta García forma parte del Consejo de Redacción y evaluación de las revistas científicas Vegueta y Trocadero, entre otras. Fue Investigadora Principal del proyecto de I+D+i de la Autoridad Portuaria de Tenerife, a través del cual publicó un libro divulgativo con material fotográfico y archivístico de gran interés para la sociedad canaria. La candidata ha organizado diversos talleres científicos y, además, ha difundido algunos de sus resultados en medios de comunicación e instituciones públicas a nivel cultural y educativo.

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| **Área Temática:** | Estudios del pasado: historia y arqueología |
| **Nombre:** | GARCÍA ESCÁRZAGA, ASIER |
| **Referencia:** | RYC2023-044279-I |
| **Correo Electrónico:** | a.garcia.escarzaga@gmail.com |
| **Título:** | Human behaviour, resilience and seasonal subsistence strategies |

**Resumen de la Memoria:**

Asier García Escárzaga has built an ascending academic career and is a well-established scholar in Scientific Archaeology, with an outstanding publication record (18 papers in high-impact JRC-indexed journals), a robust capacity in leading and collaborating in national and international projects (7 as Principal Investigator), a remarkable mobility experience (40 months: UK, Germany, Israel) and strong international portfolio.

The candidate completed his bachelor's in history at the University of Deusto (2012), Master's in Prehistoric Archaeology at the Complutense University of Madrid (2013), and PhD in Prehistoric Archaeology at the University of Cantabria (2018) (cum laude, international mention and awarded as best thesis in the Humanities area by two different authorities [UC and Juan María Parés Social Research Council]). After his PhD, he was awarded 4 highly competitive postdoctoral grants. The fellowship from the Basque Country Government allowed him to develop an innovative project at the Max Planck Institute for the Science of Human History (Jena, Germany), thus extending his scientific network. In 2021, he incorporated into the University of La Rioja with a competitive postdoctoral fellowship offered by this university. Then he obtained a Beatriu de Pinós fellowship and a Marie Skłodowska-Curie Actions European fellowship to affiliated with the Autonomous University of Barcelona. His postdoctoral career in different research centres has allowed him to gain independence and significantly extend his scientific network, reflecting thus high levels of commitment to professional growth.

His main research interest during his career has been to advance our understanding of the seasonality of the hominin subsistence strategies and the role of aquatic ecosystems in the dispersal, survival, and cultural resilience of foragers and first farmers worldwide, with a particular focus on the Iberian Peninsula. He developed a multidisciplinary approach that combines analysis of faunal remains with stable oxygen and carbon isotope and trace element analyses of shell carbonate to obtain information on the aquatic resource collection patterns, as well as on the climate conditions during the past and the impact of the climate changes to understand human behaviour and human-environment interactions. In addition, he has innovated the field of carbonate ecology by developing the Laser-Induced Breakdown Spectroscopy (LIBS) technique for measuring element/Ca ratios in shell carbonate. This cutting-edge approach can be transformative in archaeological and palaeoclimate studies based on carbonate chemistry. Although his PhD focused on the last hunter-gatherer that inhabited the Iberian Peninsula during the Mesolithic, recently, he has expanded his research and expertise to new geographic and chronological areas. He also works on coastal and inland populations in S America, N Africa, E Mediterranean Sea, and S Asia, and from the Middle Palaeolithic to the Neolithic.

**Resumen del Currículum Vitae:**

Asier García Escárzaga is an emerging expert in the field of Prehistory and Archaeology. After only five years of finishing his PhD (July 2018, cum laude, international mention and awarded as best thesis in the Humanities area), he accumulated a research portfolio of 42 publications, including 1 book as single author (BAR Publishing), 18 articles in JCR indexed journals (11 as first author, 3 as second author, 3 as third author, and 1 as senior author), 6 articles in non-JCR indexed journals and 13 book chapters. He has also edited 2 conference proceedings and is editing an ongoing special issue in the Archaeological and Anthropological Science (AAS) journal. In addition, he has delivered talks at 59 national and international conferences (37 as first author).

To date, Asier García Escárzaga has been the Principal Investigator in 7 competitive research grants, including a project funded by the Spanish Ministry for Science and Innovation in the framework of the State Subprogram for Knowledge Generation 2022 (PID2022-138350OA-I00; €123,125). He also obtained funding from national and international institutions, including the European Commission (MSCA-EF, €181,153), Humboldt Foundation (Germany) (€26,215), Basque Country Government (€112,074) and Catalonia Government (Beatriu e Pinós, €144,300), among others, which allowed him to attract over 670,000 euros. He is a member of the SGR EarlyFoods and has participated as a research collaborator in scientific projects in Spain (19) (funded by national and regional institutions) and broad (3) (funded by the Australian and Portugal Governments, and European Commission), establishing a robust research network with prehistoric and molecular archaeologists in the Iberian Peninsula (UAB, UC, UR, UPV-EHU, UCA, USAL, CSIC), Portugal (UAlg), Australia (University of Sidney) and Germany (Max Planck Institute for Geoanthropology), among others.

He co-directed archaeological fieldwork in Iberia (La Chora, 2021-2023) and Bolivia (Los Chuchíos, 2023, PID2022-138350OA-I00), demonstrating management skills and leadership. The candidate has designed and delivered modules at the undergraduate and postgraduate levels on Human Evolution, Palaeolithic, Neolithic, and Biomolecular Archaeology, totalling 260 h of teaching in three universities (UC, UR, UAB). He has also actively participated in the transfer of knowledge activities (organisation of conferences [3] and sessions at international conferences [2]) and dissemination activities (Outreach articles [2], European Researchers' Night, Pint of Science, Semana de la Ciencia, Long Night of Science, radio and podcast interviews, social media, etc.). Regarding the divulgation outputs, he has published an article in the Journal of Despertaferro. Finally, he has supervised a Master's dissertation (UAB), advises one ongoing PhD project from 2022 (UR), and has been part of a PhD panel in 2024. He is accredited as Profesor Ayudante Doctor (2019) and Profesor Contratado Doctor (2023) by ANECA.

**Resumen de la Memoria:**

I am an archaeologist working on first and second millennium AD West African kingdoms and their relationship with Europe. My research explores two different strands: the landscape organization of West African Kingdoms (with a particular focus on the Mali Empire and its successor states), and their impact on European history. My career up until now can be divided into three phases: a training one (undergrad, masters and PhD) divided between the University of Oxford and University College London (UCL), followed by two postdoctoral stages: one as Teaching Fellow in African Archaeology and project manager at UCL; and a second one as Marie Curie Fellow and postdoctoral researcher at INCIPIT-CSIC.

My initial research was primarily concerned with establishing the baselines and initial chronologies of the so far archaeologically unexplored kingdom of Kaabu, a polity that dominated a substantial part of West Africa from the 13th to the 19th C, initially as part of the wider Mali Empire, later as an independent kingdom. This pioneering research not only changed our knowledge of West African archaeology, but also contributed new theoretical concepts like the notion of 'shifting sedentism', now widely employed to describe settlement patterns across the Senegambia and beyond. In this period, I also developed my initial research networks across West Africa (fieldwork and research stays in Dakar), the US (internship at the US Library of Congress) and Europe (talks, conferences and joint publications).

Since moving back to Spain in 2019, my work has branched into two complementary directions: firstly, having already established the foundations of Kaabu's archaeology, I have focused on understanding its operation at a more detailed level, by analysing the landscape articulation of one of its royal provinces, Pathiana, as well as the archaeology of its capital Kansala (Guinea-Bissau). This in turn has led me to study its fortifications as both socio-political symbols and military tools and to insert West Africa into global conversations about defensive systems. Along with this primary focus, I have developed a secondary area of expertise in Afro-European objects, items brought to Europe and/or used by Africans residing in Europe between the 13th and 19th centuries which often embody the complexity of Afro-European relations over the centuries. As a result of these, I have become widely recognised as one of the main experts on the Mali Empire worldwide, as demonstrated by regular invitations to present at university seminars all over the world and write contributions to prestigious handbooks and encyclopedias. Thanks to my outreach programme, I am also increasingly becoming one of the main references in pre-colonial African history in Spain, as shown by regular teaching, newspaper articles and invited seminar requests . Should I be awarded this Ramón & Cajal scholarship, I would use it to consolidate my profile as the main expert on precolonial West African history and archaeology in Spain, as well as to expand my research into The Gambia and Guinea-Bissau, countries that also were feature sites associated with Kaabu but that are understudied. I would also like to use the 5-year horizon to establish long-lasting partnerships and opportunities for exchanges between Spanish and West African research institutions.

**Resumen del Currículum Vitae:**

I have a strong track record of academic excellence and pioneering research. Both my undergraduate (Oxford University) and master's (University College London) dissertations were awarded prizes (the Oxford James Currey Prize and the UCL Institute of Archaeology Master's Award, respectively). My PhD work (UCL 2016) has been widely recognized both as the first archaeological work on the Kingdom of Kaabu (Senegambia) as well as for its theoretical contribution with the notion of 'shifting sedentism', that now has its own entry in both the Oxford Research Encyclopedia of Anthropology.

Over my research career, I have participated in 18 archaeological projects in 9 countries (Spain, UK, Cyprus, Turkey, Lesotho, Gambia, Senegal, Guinea-Bissau, Mali), and directed five of them: the Upper Casamance Archaeological Project (2010-2016), Power & Landscape in precolonial West African States (2014), the Pathiana Archaeological Landscapes Project (2019-2021), Kingdoms of the Sudan (2022-2023) and Reconstruyendo Kansala (2023-2024). Since 2010, I have personally secured over 460k € in funds from competitive funders, including the European Commission (Marie Curie Fellowship, 160k), the UK Arts & Humanities Research Council (70k), and the BBVA Foundation (Leonardo Programme, 37k). In addition to being PI, I have held multiple positions of responsibility, such as Deputy Masters Tutor at UCL Institute of Archaeology (in charge of 250 students/year); managed two projects (UCL & The British Museum, dir. by Prof. David Wengrow; and Projet Waalo, dir. by Prof. Kevin MacDonald). In 2022, my project proposal TradingWorlds reached the interview stage at the ERC Starting Grant call.

My profile is very international: in addition to my 13 years in UK universities, I have completed fully-funded research internships at the Library of Congress in Washington DC and the Institut Fondamental d'Afrique Noire in Dakar and I currently have active research collaborations with colleagues and institutions in the UK (UCL, British Museum, University of Edinburgh), Germany (Frobenius Institute), Senegal (Université Cheikh Anta Diop, Université Assane Seck), Guinea-Bissau (INEP), The Gambia (University of The Gambia), and Canada (University of Manitoba).

Over the past few years, I have become recognised as one of the key experts on the Mali Empire and the Kaabu Kingdom, as demonstrated by Oxford University Press' request to write encyclopedia entries for both. I am also external reviewer for all the main Africanist archaeology journals, including Azania: Archaeological Research in Africa, the Journal of African Archaeology, and African Archaeological Review; as well as Current Anthropology, British Archaeological Reports and Journal of Contemporary Archaeology. I have been asked to do 25 invited seminars on my research in ten different countries UK, Spain, US, Italy, Senegal, The Gambia, Guinea-Bissau, Chile, Brazil, and Mexico and presented my work at over 30 international conferences.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
| **Nombre:** | LEIRA CASTIÑEIRA, FRANCISCO JORGE |
| **Referencia:** | RYC2023-045639-I |
| **Correo Electrónico:** | francisco.leira@live.com |
| **Título:** | Trauma sociopsicológico de la sociedad española durante la posguerra (1939-2023) |

**Resumen de la Memoria:**

The Spanish Civil War is one of the most impactful and devastating events in a nation's history. Spain, in the 20th century, experienced a Civil War that left deep scars and psychological traumas at both the individual and collective levels. Despite decades having passed since that conflict, its effects continue to be palpable in Spanish society. This research project aims to explore the psychological trauma resulting from the Spanish Civil War from an interdisciplinary perspective, combining historical, psychological, and social approaches. It is an ambitious undertaking that seeks to provide a comprehensive understanding of the enduring impact of this tragic period.

Objetives

1.        Understanding the Psychological Impact of the Civil War: The first objective of this research is to investigate and document the psychological impact of the Spanish Civil War

2.        Analysing Social and Political Factors: The Spanish Civil War was not only a conflict between armies but a deeply rooted social and political struggle. It is necessary to delve into the historical context to grasp the complex interplay of events that led to trauma.

3.        Exploring Resilience Strategies

4.        Contributing to Interdisciplinary Understanding, by merging historical, psychological, and social perspectives

The analysis will be based on the documentation of several Spanish asylums, as well as written memoirs and oral sources. The reasons why patients were admitted to asylums or experienced disorders without treatment will be analysed, always bearing in mind that there is no single triggering reason. However, by analysing these cases, we can gain insights into the effects of the civil war on the different groups being studied.

The first section will examine post-traumatic stress and the psychological and psychiatric knowledge of post-civil war Spain up to the 1960s. Most of the studies were not developed until the end of the Second World War and arrived in Spain later. As a result, very outdated techniques were used.In this case, a distinction must be made between men and women, as they had different experiences. Most of the males born between 1907 and 1920 were forcibly mobilised by both sides to fight in a fratricidal conflict. This traumatic experience led them to be aware that they were fighting to kill or be killed. The next generational cohort consists of war children, those born between 1921 and 1945. It must be acknowledged that this is a generation that does not have a clear memory of that time. Therefore, we have three different generations with fears, traumas and, in some cases, which have degenerated into mental disorders. This first part will focus on these three aspects, something unprecedented in Spanish historiography. The documentation to be used will be from the Conxo Asylum, which covered the northern region of the peninsula, from 1936 to those admitted in 1950 (a date to which I currently do not have access for consultation). Additionally, the documentation from the National Asylum of Santa Isabel, housed in the José Germain University Hospital and accessible to researchers, will be examined. Similarly, the General Military Archive of Ávila and the Intermediate Northwest Military Archive will be consulted in the collections of the Military Hospitals. It should be noted that physical trauma to the head may have led to mental disorders.

**Resumen del Currículum Vitae:**

I have a PhD in History from the University of Santiago de Compostela, obtaining the grade of Sobresaliente Cum Laude. My research awarded the Juana de Vega Prize in 2012 within a collaborative program involving prominent universities like UCM, UPV, USC, UAM, UAB, UV, UC, and UNIZAR, has garnered international recognition. I awarded the prestigious George Watt Prize from the ALBA of New York further acknowledged the impact of my work, reinforcing its significance in the global academic landscape.

My PhD, a ground-breaking exploration into the recruitment, wartime experiences, and demobilization of Spanish Civil War soldiers, was awarded Miguel Artola Prize by the AHC and CEPC of the Ministry of Presidency in 2019. Mi PhD published in Siglo XXI (2020) in Spanish, Liverpool University Press (2023) in English, and Galaxia (2024) in Galician, demonstrating its international reach and thematic novelty within Spanish historiography.

Embarking on my research journey in 2012, I've authored a total of 57 works, including books (including translations), book chapters, and articles. Twelve articles, six of them in English, contribute to high-impact journals recognized by JCR or Scopus. My bibliometric record boasts 96 citations and an h6 index, underscoring the scholarly relevance and reach of my work.

Beyond academic circles, I prioritize knowledge dissemination. I have a website and podcast, memoriaehistoria.com with 70 daily visits and 200 listens without external funding. Recognition from national newspapers like El País, El Mundo, ABC, or Zenda Libros for my books.

My research focus spans violence in the Spanish Civil War, combat experiences, and mobilization processes. Currently pursuing my second thesis in sociology. My recent exploration of trauma, blending psychology and criminology, emphasizes interdisciplinary collaboration for enhanced outcomes. Collaborating with a psychologist on a new investigation into pathological grief throughout history exemplifies my commitment to innovative and impactful research.

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| **Área Temática:** | **Estudios del pasado: historia y arqueología** |
| **Nombre:** | PASTOR QUILES, MARÍA |
| **Referencia:** | RYC2023-043965-I |
| **Correo Electrónico:** | m.pastor@ua.es |
| **Título:** | Learning from the earth building history of ancient societies: innovative research and meaningful dissemination |

**Resumen de la Memoria:**

After graduating in History from the University of Alicante, I wrote a Master dissertation approaching how to study earthen construction in archaeology. Then I completed a diachronic, comparative PhD on the architectural processes developed by the groups of the Southeast of the Iberian Peninsula from the Neolithic to the orientalising period, mainly but not only through the analysis of earth building remains. It brought to light construction materials and techniques virtually unknown for the contexts studied, as cob balls, and mats employed in construction parts, raised important questions, and opened very exciting new lines of inquiry which I am still pursuing, among other topics of interest, as feminist approaches to past studies and archaeology as a discipline. With a Juan de la Cierva-f. and then a year of Margarita Salas, I have worked at ICAC, Tarragona, inside the Protohistory group. Now I am enjoying the second part of that contract at INAPH, UA.

My main research contributions are linked to the reconstruction of the history of earthen architectural forms and activities, as the origins of mud brick in the Iberian Peninsula, the study of modular earthen systems, the identification of circular economy recipes in mud mixtures and the revalorisation of earthen building against climate change. I have expanded my research on past earthen construction to protohistoric and ancient times, open to address studies of other chronologies, contexts, and fields. I am also interested in other topics related to History and archaeology, as feminist approaches to these disciplines.

National and international mobility has been central in my career. I have completed three years of postdoc contracts outside of the institution where I presented my PhD, adding to these 14 and a half months of fruitful stays in varied foreign centres of relevance, with important results, exchanging ideas and promoting solid collaborations. This experience has allowed me to learn a lot, have important scientific opportunities and to work with different scholars, growing enriching networks towards doing better and more meaningful science.

Since the beginning of my academic career, I have been working independently with interdisciplinary teams, mostly to study various aspects related to past architecture, from Prehistory to ancient times, national and from abroad (Italy, Portugal, Germany). These are contributing to increase knowledge and appreciation of earthen architecture in the archaeology of different periods of the past. My transversal profile has allowed me to work closely with many specialists in earthen studies, as well as from other fields. I have participated in meetings organised in different countries and have published in varied international journals and publishing houses. My research is known abroad, especially in Latin American and European countries, and I am contacted to review scientific papers from different kind. I have experience in dissemination activities as 11 de febrero, #100tífiques, Noche Europea de la Investigación/Mednight and Setmana de la Ciència, and with talks given in schools and associations.

In the last years I have been growing a team thanks to the co-organisation of various initiatives, projects, and contracts (to date I have raised 164800€ for research since I finished my PhD), and thanks to mentoring, teaching, and supervising.

**Resumen del Currículum Vitae:**

Graduated in History (Extraordinary Award, Scholarship for Academic Excellence G. Valenciana, End-of-degree National Award), Master in Archaeology (2015), Secondary Education (2020) and Doctor in 2019 (sobresaliente cum laude, International Mention, Extraordinary Award), I have worked three years at ICAC as a postdoctoral researcher, with a J. de la Cierva-f. (50000€), followed by a M. Salas (70700€).

My main line of research focuses on the transversal archaeological study of past construction processes, focused on earthen building, with a multidisciplinary methodology based on macroscopic analysis, complemented by microscopic, ethnoarchaeological and experimental approaches. I am PI of projects to better identify stabilisers in mud mortars (4000€, Palarq), on the earthen architectural systems that use modules (20000€, G. Val.), and to prepare an ERC StG (9000€, G. Val.) on earthen heritage against the ecological crisis.

I am author of 4 books (+2 in prep., Archaeopress), 47 chapters and proceedings, 41 articles (incl. in press), and 53 contributions in scientific meetings. I have co-organised several international events, including Methods and Techniques for the Study of Ancient Architecture in Archaeology (2021). In November 2023 I organised the Seminar Ethnoarchaeology of buildings. How can it help the study of the past? (IP of grant funded with 9000€, G. Val.). I have carried out several funded research stays, in the Archaeology Depts. from the University of Reading (3 months 2016), and Southampton (2 weeks 2017, 3 months 2018). Also, in the State Office for Heritage Management and Archaeology Saxony-Anhalt (2 months 2017), developing an international collaboration to help identification of earth building techniques. I have been Visiting Scholar at Cambridge, Faculty of Classics (2 months 2021), where I addressed rammed earth in Antiquity, continuing to widen the chronological scope of my studies. Also, at the DAI in Berlin (3 months 2022), developing different collaborations (as EAA sessions & Special Issue in World Archaeology). In 2023, while pregnant of my daughter, I was in UNIARQ, Lisbon, starting studies on sites of a wide diachrony, and then 1 month at University of Padova, with a team studying Roman architecture.

I join multiple national and international projects, including one under evaluation for Horizon Europe on AI and heritage, and have reviewed papers for InterSecciones en Antropología (Argentina), Gremium (México), Zephyrus or JAS: Reports (Netherlands), as well as for Terra 2022 13th World Congress on Earthen Architectural Heritage, being under evaluation for the JAS: Rep Early Career Board. Having been Jury of the Archaeological Research Awards "J. María Soler" (2022), I am a member of the EAA, AGE, PROTERRA, AMIT, AWAP and La Facultad Invisible.

Accredited as Contratado Doctor and with a six-year term evaluation of research activity (sexenio, ANECA) in May 2020, I am also habilitated to teach in English, German, and Catalan (with C2, C1 and C1). I teach in four Masters: History of the Mediterranean World, Archaeology, UA, and Secondary Education, there and at VIU. I have tutored 14 Master Dissertations and have 5 more ongoing, addressing archaeology and heritage, two of them regarding conservation and analysis of earthen architecture, supervising the grant (Beca Iniciación a la Investigación) of one of those students.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | RAJA GALIAN, VICENTE |
| **Referencia:** | RYC2023-045124-I |
| **Correo Electrónico:** | vicendio@gmail.com |
| **Título:** | Radical Embodied Neuroscience: Theory and Experiment |

**Resumen de la Memoria:**

My main research line since I got my PhD and also the research line I aim to pursue for the next 5 years is the further development of a radical embodied neuroscience. It is based on two fundamental realizations. The first one is that a proper understanding of cognitive phenomena must provide an account of the brain-body-environment system as the fundamental unit of analysis. The second one is that synchronic and diachronic dynamics at all scales of analysis are central for the understanding of the mentioned cognitive phenomena. My research has been committed to these two realizations for over a decade now in which I have been exploring the problems that required a solution if a radical embodied neuroscience was to be a viable framework to study mind and brain. So far, I have made advances in two of these problems: (i) the relationship between behavioral and brain dynamics when taken as aspects of a multiscale characterization of cognitive systems and (ii) the dynamical organization of the transitions between cognitive events. My works on the ecological notions of resonance and enabling constraint have provided a theoretical basis from which the experimental implementation and advancement of a radical embodied neuroscience is possible. Moreover, I have taken the first steps towards such implementation and advancement with the activities I have developed in the project in which I am the PI.

The backbone of my line of research in the following years will be, therefore, the expansion and extension of these theoretical and empirical activities. More concretely, I will pursue two interrelated research objectives. The first research objective is to widen the historical, philosophical, and disciplinary scope of radical embodied neuroscience. The main outcome of this objective is a book that is halfway between a manifesto and a set of recipes for a radical embodied neuroscience.

The second research objective for my next few years of work is the integration of radical embodied ideas and the methods of mobile Brain Imaging (moBI). The outcomes of the second objective will be more diverse than the one(s) expected from the first objective as they will not consist in just publications, but also in the development of methods and open-access functional code to be used in the analysis of moBI experiments from the point of view of radical embodied neuroscience.

The significance of this line of research and its two main objectives rests in their intrinsic interdisciplinary character. Cognitive neuroscience suffers from problems like the lack of a proper conception of natural stimulation in brain imaging scenarios, the replicability and generalizability crises, or the disputed significance of contemporary artificial intelligence to understanding human cognition. A radical embodied neuroscience has the capacity to provide solutions to some of these issues by improving our account of the role of body and environment in cognition. Radical embodiment brings neuroscience back to the daily body-environment interactions and, therefore, it has the potential to re-frame neuroscientific research both in research and clinical & social settings. Radical embodied neuroscience promises a neuroscience with a more human face. And that promise is worth pursuing.

**Resumen del Currículum Vitae:**

Since my recent PhD (U. of Cincinnati, USA, 2018), I have had a very active research career. From 2018 to 2022, I was a research fellow at the Rotman Institute of Philosophy (Western University, Canada). There I started the EMRG Lab for the philosophy of cognitive science. From September 2022, I am a Juan de la Cierva-Incorporation researcher at the University of Murcia. At the University of Murcia, I am a member of the MYRTOS research group (E091-09) and a member of MINT Lab in its philosophy department.

I have published more than 20 articles in top-tier JCR/SCR journals (17 articles in Q1 | Google Scholar: 644 citations; h-index 15; i10-index 17) and book chapters with Routledge, Springer and Oxford University Press, among others. My work is multidisciplinary and I have published both in leading journals within philosophy (e.g., Synthese, Philosophical Psychology, Minds and Machine) and in leading journals within the fields of neuroscience, psychology and biology (e.g., Physics of Life Reviews, Scientific Reports, Behavioral and Brain Sciences). In a good number of these publications, I have developed a theory of "ecological resonance" that has served as the starting point of a revival of the interest in cognitive neuroscience from the point of view of ecological psychology and radical embodied cognitive science. Some other works have been part of the general discussion regarding the Bayesian brain and the Free Energy Principle both within academic settings and for the general public (e.g., I have participated in several podcasts and Youtube interviews discussing these issues with some of the leading researchers in the field).

I have edited a book with Routledge (2023) and will soon deliver a book I am preparing for Cambridge University Press (in press; publication expected in the 1st half of 2024). I have edited a special issue of the Journal of Consciousness Studies (2021) and am editing a special issue for Topics in Cognitive Science (topiCS; ongoing publication). In addition, I have been a reviewer for multiple philosophical and cognitive science journals and am a member of the editorial staff of Frontiers in Psychology and Frontiers in Neuroscience.

Currently, I am the Principal Investigator (PI) of a "Proyecto de Generación de Conocimiento" of the Spanish Ministry of Science and Innovation (PID2021-127294NA-I00). In addition, I am a member of the projects "Neural Reuse, Embodied Cognition, and Dynamic- Systems Approaches to the Brain" funded by the Social Sciences and Humanities Research Council of Canada (PI: Michael L. Anderson) and the projects "Metaphors and Narratives in the Social Structuring of Cognition: Implications for Philosophy of Science and Epistemology" (PI: Sergio Fernando Martínez Muñoz) and "Interculturalidad en las prácticas científicas y tecnológicas: Configuraciones de comportamiento y racionalidades" (PI: Melina Gastélum Vargas) funded by la Dirección General de Asuntos del Personal Académico de la UNAM (DGAPA) in Mexico . Additionally, I have received funding in small

amounts from research agencies such as the US National Science Foundation (NSF), the Spanish Foundation for Science and Technology (FECYT) or the Indian Council of Philosophical Research.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | MALDONADO MALDONADO, MORA |
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| **Correo Electrónico:** | mormaldo@gmail.com |
| **Título:** | An experimental approach to semantic universals |

**Resumen de la Memoria:**

My research over the past years has been focused on three main axes. First, I have investigated the interpretative processes involved in our understanding of ambiguous sentences—i.e., sentences that systematically give rise to more than one interpretation—with a specific focus on plural ambiguous sentences. I have used different experimental tools (acceptability judgments, structural priming and mouse-tracking recordings) to assess whether the abstract mechanisms proposed by linguists to generate alternative interpretations have a psychological correlate during comprehension. Among other conclusions, my research has shown that distributive, collective and cumulative readings of plural ambiguous sentences can be independently primed.

Moreover, I have also adopted a formal approach to investigate how cross-linguistic variation can inform semantic theories with respect to a wide range of semantic properties that do not seem to be easily accounted for by a universal approach. My research on the semantic import of plural marking in Spanish interrogative words, for example, has served to show that current approaches to number marking need to be refined in order to account for both cross-linguistic and within-language variation. Similarly, I have explored the existence of contra-factive predicates, which had not been identified before in the literature on attitudinal predicates.

Finally, I have investigated meaning and grammar by means of artificial language learning experiments. I have brought experimental methods to the study of semantic universals, providing evidence for a universal set of semantic features that characterize person systems.
I have also extended this approach to phenomena at the syntax-semantic interface, exploring the interpretation of sentences with multiple negative elements in an artificial setting. My work on negation suggests that some cross-linguistic tendencies, such as the prevalence of negative concord in the world's languages, might result from biases at play during learning.

In the future, I plan to rely on my expertise to continue this last line of research by extending it to new semantic phenomena. In particular, I propose to apply experimental and modelling techniques to assess the general hypothesis that typological regularities or tendencies in semantics can be explained as arising from the interaction of different forces, including learning biases and communicative pressures.

**Resumen del Currículum Vitae:**

I am an experimental semanticist, which means that I study how languages express meaning with experimental methods. Since 2022, I have held a tenured CNRS researcher position at the Laboratoire de Linguistique at Nantes Université. Previously, I was a Juan de la Cierva-Formación fellow at the GLIF research group (Universitat Pompeu Fabra) and a postdoctoral researcher at the Centre for Language Evolution (University of Edinburgh). I completed my Ph.D. at the Ecole Normale Supérieure in 2018 under the supervision of Emmanuel Chemla and Benjamin Spector.
Since the early stages of my Ph.D., I have engaged in high-level research, publishing in reputable journals like Cognition, Journal of Memory and Language, Linguistics Inquiry, and Journal of Semantics. In under five years post-Ph.D., I've authored 20 publications, including 10 in Q1 journals, 8 peer-reviewed proceedings, and 2 book chapter contributions. In addition, I currently have 4 papers under review.
My work has made a considerable impact, as shown by 248 citations (h-index: 9), 190 since my Ph.D. I was invited to present at over 10 research seminars, I served as a keynote speaker at the British Academy's conference, The Alphabet of Universal Grammar, and the ESSLLI workshop Computational and Experimental Explanations in Semantics. My research has been presented at over twenty international conferences and workshops, showcasing its international orientation, developed across six research centers with collaborations involving more than 15 researchers.
My work exhibits a strong international focus, spanning six global research centers and collaborations with over 15 researchers. A notable achievement includes securing a prestigious grant with Benjamin Spector from the Agence Nationale de la Recherche for a 48-month project.
In terms of academic service, I have reviewed for over 18 international journals, including impactful ones such as PNAS and the Journal of Memory and Language. Alongside contributing to funding institutions like NSF and various conferences, I took part in organizing three international workshops. The most recent, titled 'Revisiting LoT: New Advances in Cognitive Sciences, Linguistics, and Philosophy,' hosted at Nantes Université, brought together over 10 researchers from diverse fields and corners of the globe.
Beyond my research pursuits, I bring valuable teaching and mentoring experience. I've designed courses at both undergraduate and master's levels, covering topics such as experimental methods, psycholinguistics, and semantics. Notably, I created a master's seminar, 'Current Issues in Formal Linguistics,' during my Juan de la Cierva fellowship. I've also supervised master's students at Nantes Université, Universitat de Barcelona, and the University of Edinburgh, and participated in a Ph.D. jury at the University of Groningen.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | DORAN , RYAN |
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| **Correo Electrónico:** | rpdoran@gmail.com |
| **Título:** | Frontiers in Experimental Philosophical Aesthetics |

**Resumen de la Memoria:**

Selected scientific contributions: I have published 13 high-impact articles in generalist and specialist philosophy journals, with a further 4 under review. A large majority (82%) of my papers are published in Q1 and 73% are published in the top 11% of journals indexed by the WoS and/or Scopus databases. In these publications I have made five principal contributions: (1) I have offered the first closed account of ugliness in contemporary philosophy (in a paper that won the 2024 Danto Prize from the American Philosophical Association); (2) I have revived the idea that people's moral goodness is able to contribute to their beauty, characterising the forms that moral beauty can take; (3) I have overturned the debate on whether the beauty of the environment gives reasons to protect it, and offered a novel account of the relationship between beauty and moral standing; (4) I have shown that there is no distinctively aesthetic kind of pleasure; (5) I have cast light on the nature of contamination-based thinking.

Selected internationalisation & mobility: After completing a Teaching Fellowship at the Uni. of Sheffield, I moved to the Uni. of Cambridge, where I completed 5-years of postdoctoral work. I then secured a María Zambrano Fellowship to join the LOGOS Research Group at the Uni. of Barcelona. During my María Zambrano, I took up a Visiting Scholar position (3 months) at the École Normale Supérieure to develop collaborations with Dr Isidora Stojanovic, Dr Margherita Arcangeli and Prof. Jérôme Dokic. Towards the end of my María Zambrano, I secured a Barcelona Institute for Analytic Philosophy Fellowship to work with Prof. García-Carpintero on the delivery of a work package on experimental philosophy for the María de Maeztu project on the nature of evidence. I have recently taken up a Visiting Scholar position as the result of an invitation from Prof. Elisabeth Schellekens to spend the Spring term 2024 (6 months) at Uppsala University.

Selected independence: I have played a leading role in the development, management and execution of research projects, collaborating with interdisciplinary experts and mentoring junior academics to pursue an innovative programme of impactful research. For example, I am currently Co-Director (Co-I) of a three-year project—"Higher Values"—at the Uni. of Cambridge with Prof. Simone Schnall, funded by a grant for €796.000 from the Templeton Religion Trust. In my capacity as Co-Director, I have been responsible for the philosophical direction of the research, the supervision and training of research team members, and collaborating on experimental designs.

Selected lines to be developed: (1) I will take my work on the relationship between aesthetics and moral psychology in a new direction, by examining whether the appreciation of different kinds of aesthetic properties leads to adopting different moral attitudes. Specifically, I will examine whether beauty leads to care, and sublimity leads to respect. (2) I will considerably extend my work on aesthetic properties and linguistics, and specifically the idea that some aesthetic concepts, such as BEAUTY, are dual-character concepts, in having a descriptive sense, in addition to a deeper normative sense. I will do this by, for example, examining whether the diagnostic patterns for dual-character concepts are present for "beauty" in a range of Romance languages.

**Resumen del Currículum Vitae:**

I have a strong reputation for an innovative programme of research advancing debates at the intersection of aesthetics, moral philosophy and cognitive science. My research draws on novel experimental methods to offer empirically-informed accounts of our aesthetic and moral capacities. I have developed this body of scholarship through considerable research funding capture and high-quality, award-winning articles in world-leading philosophy journals. As evidence of my contributions to the field, I was recently awarded the 2024 Arthur Danto Prize by the American Philosophical Association for my paper "Ugliness Is in the Gut of the Beholder".

Scientific contribution: I have published 13 high-impact articles in generalist and specialist philosophy journals, with a further 4 under review (total: 17). I am lead author of 15 of these (sole author of 12) and have collaborated on papers and special issues with 7 co-authors from across the US, Australasia and Europe. The majority (82%) of my papers are published in Q1 and 73% are published in the top 11% of journals indexed by the Web of Science and/or Scopus databases. My H-index is: 4 (Google Scholar), 3 (WoS), 2 (Scopus). Comparing research in the same field, my Field-Weighted-Citation-Impact score is 3.67, with my research cited 267% more than philosophy articles of a similar age.

Research leadership: I have an outstanding track record of research funding capture (~€1.458.553) and project leadership as a PI and Co-I, developing and managing research projects funded by international funding agencies. For example, I am currently Co-Director of a large 3-year interdisciplinary project (~€796.000) funded by the Templeton Religion Trust. For this, I have recruited and currently co-supervise three postdoctoral Research Associates, a Research Assistant, and multiple students. I have also helped shape the discipline of Philosophical Aesthetics, and supported junior researchers in Philosophy to forge links with the empirical sciences. For example, I launched a new open-access journal—Debates in Aesthetics—published by the British Society of Aesthetics, to facilitate exchange between philosophical aestheticians. I co-edited two special issues collaborating with leading philosophers—Prof. Stephen Davies (Auckland) and Prof. Jenefer Robinson (Cincinnati).

Academic citizenship and mentoring: I am committed to the training of early-career researchers and the development of empirically-informed aesthetics. I am Chair and one of the founding members of the iCog Network—a network offering research training, funding and dissemination opportunities for early-career cognitive scientists. I have served on multiple scientific committees and project advisory boards to support research projects and the development of academic conferences (such as the British Society of Aesthetics' Annual Conference, Oxford University). I am co-organiser of the Spanish Society of Analytic Philosophy's annual workshop on Mind, Art and Morality in 2024, securing contributions from Prof. Knobe

(Yale). I am a member of the Gender Action & Ethics Committee of the Barcelona Institute of Analytic Philosophy, supporting BIAP on diversity and equality issues. I have also supervised and mentored a number of junior postdoctoral researchers, including Dr Mikalonyte; (Cambridge), Dr Stevanov (Cambridge & Bristol), & Dr McKendrick (Cambridge).

**Resumen de la Memoria:**

I conduct research in cognitive science. In my work, I aim to understand why languages are the way they are; how they came to be this way; and what this tells us about their users' cognition and about how they interact with the world. My research is highly interdisciplinary. In it, I leverage Bayesian and deep learning methods to study how linguistic knowledge is acquired, represented, and used by both humans and machines. With this dual perspective on the linguistic abilities of humans and statistical models, I aim to shed light on linguistic phenomena from complementary angles; endowing computational models with more human-like capabilities and understanding more about human language through computational models.

My research has a strong impact in my fields. I have been cited at least 265 times according to Google Scholar (h-index of 7, i10-index of 5). I have published multiple journal articles in top outlets of my areas (i.a., "Science", "Cognition" and "Cognitive Science", for all of which I am the first author). My work has been covered by multiple media and news outlets, both nationally and internationally (see, e.g., Footnote 2 above). My recent paper in Science has garnered particular attention, already figuring in the top 5% of all research outputs tracked by Altmetric after just a few months' time.

To date, my research has substantially advanced our understanding of the way meaning is cross-linguistically organized and the dynamics of change involved in the use of language, both in natural and artificial languages. In the past years, I have built a solid foundation of theoretical and practical knowledge to carry out innovative research at the interface of computer science and cognitive science. I do so with the two-fold goal to both better understand how meaning is organized as well as how state-of-the-art statistical models (e.g., neural network models) can be endowed with more human-like characteristics when it comes to dealing with novel or uncertain linguistic input.

The next steps in my research concern a continued development of novel methods and resources to probe to which extent the way human meaning is organised is affected by (i) its genealogical past (phylogeny); (ii) its cultural history and present context; and (iii) constraints that apply on language for it to be learnt and transmitted.

Research on factors (i)–(iii), both individually and in terms of their interplay, is novel and impactful. More broadly, a Ramón y Cajal fellowship will provide me with the necessary resources to consolidate myself as a leading researcher in my field at the international stage; and to continue pursuing innovative research that pushes the boundaries of the current state of the art. With this, I also aim to contribute to positioning Spain as a leading referent in computational linguistics and computational cognitive science, as well as to enrich and promote European research more generally.

**Resumen del Currículum Vitae:**

Since 2022, Thomas Brochhagen is a tenure-track professor at the Universitat Pompeu Fabra (Barcelona, Spain). He conducts research in cognitive science, as a co-PI of the Computational Linguistics and Linguistic Theory group. His work aims to understand why languages are the way they are, how they came to be this way, and what this tells us about their users' cognition and about how they interact with the world. In his research, he leverages statistical and deep learning methods to study how linguistic knowledge is acquired, represented, and expressed by both humans and machines.

To date, Dr. Brochhagen has published in top journals of his research areas (i.a., in the journals "Science" and "Cognition"); in peer-reviewed proceedings in leading international outlets (i.a., "Annual Meeting of the Cognitive Science Society" and "EMNLP"); and he has been invited to contribute to book chapters. The impact of his research is reflected by the quality and reception of his publications. To highlight a recent example: He is the first author of an article in Science which addresses fundamental issues on the link between ontogeny and phylogeny in the evolution and deployment of meaning.

Due to the interdisciplinarity of his research, Dr. Brochhagen has an active and growing network of national and international collaborators. These ties are evidenced by his publication record, working, in 2023 alone, with researchers from the University of Toronto, Yale University, Oxford University, the University of Tübingen, the National University of Mongolia, and the French CNRS. They are also reflected by funded collaborations with the University of Gothenburg, the University of Toronto, and the Universitat Pompeu Fabra. This network is a result of his continued internationalization and mobility. He received a bachelor's and a master's in linguistics from the University of Düsseldorf, Germany, after which he conducted doctoral research in The Netherlands, at the University of Amsterdam. Within this period, Dr. Brochhagen also spent time at the Artificial Intelligence and its Applications Institute in Edinburgh, Scotland, and the SONY Computer Science Laboratory in Paris, France.

As for training and mentoring young researchers, he has taught and assisted classes in graduate and postgraduate programs in Germany, Spain, and The Netherlands. He has also supervised numerous junior researchers. Since 2022, he also co-leads a research group at the Universitat Pompeu Fabra.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
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| **Correo Electrónico:** | gloriandrada@gmail.com |
| **Título:** | From Cognitive Injustice to Cognitive Flourishing: Cognitive Development in an Unjust World |

**Resumen de la Memoria:**

I work primarily in philosophy of mind, philosophy of cognitive science, and epistemology. A unifying theme of my research concerns the bearing that the social and material (collectively the cultural) environment has on human cognition. To this end, I have investigated the boundaries of cognition, the nature of skills and abilities, and the role that conscious thought plays in knowledge and in skillful action. This has allowed me to become an emerging leading figure in extended cognition research, producing some cutting edge research at the intersection between philosophy of cognitive science and social epistemology.

My research output so far consists of articles more than 9 papers, 5 of which are published in Q1 journals (SJR ranking).

My previous research in extended cognition and knowledge has been key for the project (From Cognitive Injustice to Cognitive Flourishing: Cognitive Development in an Unjust World) that I will develop in the next 5 years as a Ramón y Cajal fellow. In fact, this project is a natural, yet innovative, consequence of my previous research for two main reasons. First, while it still focuses on human-technology interactions, it departs from an idealized picture and focuses instead on non-ideal scenarios, that is, real-life situations where there is social injustice. Second, it goes beyond an extended cognition approach to cognition and focuses more broadly in cognitive enculturation and the transformation of cognitive abilities through social learning in a structured environment.

The project is divided into four interconnected work units. The first one examines the different enculturation processes of human cognition. It explores the cognitive transformations that take place during cognitive development, including in later stages in human life. The second unit identifies the different types of cognitive harm that can be caused by the cultural environment. It also aims to distinguish a subtype of cognitive harms that qualify as cases of what I have called "cognitive injustice", where the harm plays a role in sustaining oppressive social structures. The next work unit tackles instead what is it like when cognitive enculturation goes well, and we find ourselves in a situation of cognitive justice. To this end, I rely on the notion of cognitive flourishing, and come up with a multidimensional framework that respects neurodivergence and other forms of diversity (e.g., cultural diversity), but that at the same time can be to some extent operationalized. Finally, the fourth work unit examines the space left for agency over enculturation and cognitive flourishing in our current cognitive ecology (Hutchins 2010; 2024). This will be addressed in two structured goals. The first one engages in an analysis of interfaces User Experience (UX) design and engage in case-studies of different AI-endowed technologies (e.g., social media apps, or LLMs). The second one proposes a set of guidelines for cognitive flourishing in our current world. This includes both individual and collective forms of responsibility, as we are not passive recipients but active agents of culture. This project will produce publications in leading philosophy journals, an edited book, a book publication, interdisciplinary workshops and seminars, and other accessible educational resources.

**Resumen del Currículum Vitae:**

I am an FCT Junior Researcher at NOVA Institute of Philosophy (IFILNOVA), NOVA University of Lisbon (2022–). While holding this position, I have been a visiting scholar at the University of California, Irvine (Aug-Dec 2022). Prior to this, I worked as a lecturer at UCLA, Department of Philosophy (2021–2022), and as a research assistant at IFILNOVA (2019–2020). In June 2020, I received my Ph.D in Philosophy from the Autonomous University of Madrid (mención internacional, cum laude, UAM 2020 Extraordinary Award). During my doctoral training I worked as a researcher in training (FPI 2015-2019) at UAM, and was a visiting PhD student at Glasgow University (2018), Macquarie University (Sydney, 2017) and at the University of Edinburgh (2016). In 2021, I was awarded the Juan de la Cierva–Formación postdoctoral fellowship, the Margarita Salas postdoctoral fellowships, and was offered a teaching post at Glasgow University.

I specialize in philosophy of mind, philosophy of cognitive sciences and epistemology. I'm also competent in philosophy of technology, phenomenology, and feminist theory.

I have 16 publications. 5 papers in prestigious Q1 journals (SJR ranking). These papers focus on: enhancement and know-how (Inquiry, 2024, [SJR, #47]; the possibility of states of extended knowledge-how (Philosophical Explorations 2022, SJR #91); phenomenal transparency as a condition for the extended mind (Synthese 2022, SJR #30); how different notions of transparency in AI systems bear on human agency (AI and Society 2022, SJR #35), and on the bearing that automaticity and consciousness has on extended cognition and knowledge (Synthese 2019, SJR 30). In addition to this, I've published a paper in the Australasian Philosophical Review for a volume on Sally Haslanger's work (Haslanger then published a response to my criticism), two book chapters in volumes with publishers ranked in top 5 SPI positions, two book reviews, one encyclopedia entry, and six other articles. I have also been invited to write two entries in the prestigious BrainsBlog, and an entry in the Women Section of the APA blog

I have delivered 48 talks across North America, Latin America, and Europe. Of these, 29 talks were by invitation. I have also been part of 3 scientific committees, and I've contributed to the organization of more than 16 research activities and events (conferences, seminars, workshops) at IFILNOVA and UAM.

My work has received 95 citations (Google Scholar). My PhilPeople Citation Score (over the past five years) falls within the top 1% in philosophy of mind.

My teaching experience is broad, comprising over 187 hours of teaching. I have taught courses in philosophy of mind, epistemology and feminist philosophy at UCLA (as sole instructor), where I've received excellent student evaluations. I have co-taught a course on communication at IFILNOVA. I've been a member of 4 international research groups (Scotland, Australia, USA, Portugal), and 6 international philosophy departments (Scotland x2, Australia, Portugal and USA x2). I have also been a member of 3 national projects and 2 international projects.

I have been the recipient of prestigious grants and prizes such as a Young European Researcher Mobility Award. My Ph.D dissertation received the 2020 UAM Extraordinary Ph.D Award. Since I obtained my Ph.D. in 2020, I have attracted funding for over 367.000,00€

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | STOEHR , ANTJE |
| **Referencia:** | RYC2023-042497-I |
| **Correo Electrónico:** | a.stoehr@bcbl.eu |
| **Título:** | Bilinguals' and multilinguals' sound learning and processing |

**Resumen de la Memoria:**

I investigate how bi- and multilinguals master the sound systems of their languages during acquisition and processing.

My work's theoretical framework is based on the view that bi- and multilinguals are not several monolinguals in one person, meaning that bi- and multilinguals likely deviate from monolinguals in their pronunciation. Within this framework, I ask questions related to how bi- and multilingual children acquire several sound systems simultaneously, how bilingual adults process their languages, and how adults acquire novel sound systems when learning a new language.

I take three complementary methodological approaches: (1) examining multilingual language processing in real time, (2) studying language learning in controlled experimental settings, and (3) exploring individual differences. My main methodological expertise is in the phonetics of speech production, but I use a wide range of methodological tools including standardized tests, behavioral, and electrophysiological paradigms, as well as advanced statistical analyses.

My current research agenda comprises three main research lines:
1. Crosslinguistic interactions in multilinguals: I examine how various languages interact when multilinguals speak. I am particularly interested in the bidirectional interaction of two non-native languages because these insights may substantially inform language education. My research revealed that learning an additional language may affect phonetic and lexical skills in already acquired languages.
2. Orthographic effects on speech: This research line investigates how the mapping between sounds and letters may influence speech processing in bilingual adults and children. This largely overlooked topic is important because most foreign language learners are exposed to oral and written input simultaneously. My research showed that bilingual adults' speech processing is affected by differences in the sound-letter mappings between their languages even if they learned them both during early childhood.
3. Phonetics of bilingualism: This research line includes research on bilingual children's language development and bilingual adults' language processing. I am primarily interested in how individual difference factors affect speech production and perception in diverse populations. Major findings include that the input quantity and quality in children's less dominant language is positively associated with their phonetic skills in that language without having detectable negative consequences for their dominant language.

The findings of my research agenda push the boundaries of existing scientific knowledge by demonstrating that monolingual and bilingual language acquisition operate more similarly than previously assumed and by identifying novel factors that can explain deviances between monolinguals' and bilinguals' speech production and perception.

Building on this theoretically grounded work, I will develop an applied research line that aims to improve foreign language learning outcomes in adults and children. The research experience I have accumulated has equipped me with invaluable theoretical knowledge, as well as cutting-edge technical and analytical skills. Most importantly, it has helped me refine my research questions and evolve into an independent researcher with a comprehensive research agenda and collaborators around the world.

**Resumen del Currículum Vitae:**

I am a postdoctoral researcher and PI of a Project I+D+i at the BCBL (Spain), and an affiliated researcher at the Pennsylvania State University (USA).

Education: I obtained my PhD in Linguistics from Radboud University and the International Max Planck Research School for Language Sciences at the Max Planck Institute (Netherlands) in 2018. I hold an MA in Linguistics and Cognitive Science (University of Delaware, USA) and a BA in Linguistics (University of Hamburg, Germany).

Research: I conduct quantitative research at the interface of phonetics and psycholinguistics with a focus on bilingualism. My research has been published in the field's top-ranking Q1 journals (8 first-authored, 13 total), a monograph, and an edited volume. I am currently writing an invited expert chapter for Wiley-Blackwell's handbook on Second Language Listening. My research has been presented on 54 occasions (1 upcoming invited keynote, 12 invited talks, 41 conferences) in Europe, North America, Asia, and Australia, and the quality of these presentations has been recognized with 2 awards for best oral presentation.

Funding: My predoctoral research and scientific training were funded by prestigious grants promoting international mobility (Fulbright, German Academic Exchange Service, Linguistic Society of America). Moreover, my postdoctoral career development has been funded by highly competitive grants, including a Project I+D+i as sole PI (score 97.63/100), Marie Curie (score 98/100, top 1.16%), and Juan de la Cierva (score 100/100, 1st rank). I am a research team member in 5 additional projects funded by the ERC, MINECO and NSF. My work has led to various international and interdisciplinary collaborations with several renowned researchers, such as Drs. Hayes-Harb, van Hell, Xu (all USA), de Bruin (UK), and Kupisch (Germany), all leading researchers in their fields.

Teaching & supervision: I have been primary and secondary supervisor on 4 PhD dissertations (2 defended summa cum laude, 2 ongoing). I also supervised 15 MSc and BSc students since starting my PhD. My teaching comprises graduate and undergraduate seminars, and I have given invited guest lectures in the United States and Austria.

Science administration & service: I act on technical and scientific committees, and co-organize international conferences. Most recently, I am leading the scientific and organizing committees of the International Symposium of Bilingualism, which will be held in San Sebastián in 2025. Due to my internationally recognized expertise I have served as an invited expert area co-chair for the psycholinguistic discipline at an international conference in Australia in 2023, a reviewer for the Spanish State Research Agency and the German Research Foundation; and reviewed 36 manuscripts in various international journals and abstracts for 5 conferences in linguistics, psychology, and neurobiology. I have managed special interest groups and research group meetings, and I currently coordinate the internships within my research group.

Outreach: I regularly promote public science awareness in outreach activities directed at adults and children, including live EEG/ERP demonstrations. My research has attracted substantial public interest in the international media, with 5 radio interviews and 17 written communications.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
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| **Título:** | Rules, Meaning, Propositional Content, Perception |

**Resumen de la Memoria:**

My primary areas of research are foundational questions in philosophy of language and mind, but I also have interests in metaphysics, epistemology, metaethics, philosophy of law, philosophy of games and sport, and the history of 20th-century analytic philosophy (esp. Wittgenstein). My work can be divided into four main research clusters: 1) linguistic meaning, speech acts, and language use; 2) rules and normativity; 3) propositional thought and the metaphysics of propositions; and 4) perception.

Linguistic expressions are meaningful and that is why competent speakers can use them to perform speech acts and communicate. But what is it for an expression to be meaningful in a language like English or Estonian? Since my dissertation, I've been developing a new version of a Rule-Based view on which for a linguistic expression to have a meaning in a public language is for it to be governed by a conventionally accepted rule that permits its use in certain conditions (e. g. its use-conditions). I'm currently writing a book on the nature of linguistic meaning with the plan of submitting a complete draft to OUP by the end of this academic year. During the project I plan to take this line of research into a new direction to improve our understanding of language use and speech acts. One of my main aims is to show how the Rule-Based perspective can illuminate our understanding of institutional speech acts that go beyond mere language use.

We are everywhere surrounded by rules that constrain us, but also make things possible. Social rules and laws regulate countless aspects of our everyday life and thereby support its smooth functioning. Constitutive rules make possible playing games, and, on some views, speaking languages, performing speech acts like assertion and even works of contemporary art. But what are regulative rules in general and how are constitutive rules special? My research on rules is focused on these and related questions. On my view, regulative rules are general normative contents that are in force due to human activity: enactment by an authority or acceptance by a community. Constitutive rules are special in that they always specify necessary and sufficient conditions for the antecedent action to have a particular deontic status and in that they're put in force for the sole reason that it makes the new rule-constituted action possible. And to perform a rule-constituted action is for you to perform the antecedent action while the rule is in force for you. During the later years of the project I plan on shifting the focus to this line of research. Rules are explanatorily central to numerous philosophical sub-fields ranging from the more obvious social philosophy, philosophy of law, and philosophy of sport and games to philosophy of language and mind, metaethics, epistemology, and aesthetics. Yet, current philosophical theorizing on rules themselves remains diffuse and underdeveloped and no unified theory that illuminates all of their aspects in a way that can serve as a common springboard for their explanatory use has been attempted. My aim is to develop such a unified, comprehensive, and detailed, theory of rules.

**Resumen del Currículum Vitae:**

I did my undergraduate studies in philosophy and political science at the University of Tartu and completed my PhD at the University of Southern California with a dissertation on meaning and rules in 2014. Since then I've worked as a Visiting Assistant Professor at Rice University, completed Postdoctoral Fellowships at Institut Jean Nicod, University of Tartu, and University of Barcelona, and worked as a Teaching Fellow at the University of Edinburgh. Since 2021 I work as a Postdoctoral Fellow at the University of Vienna, having won a competitive Lise Meitner grant from the Austrian Science Fund (FWF).

Over the past 10 years I have established myself as a leading scholar in philosophy of language and mind, ranking in the top 1% in publication volume, citations, and downloads in the general area Metaphysics & Epistemology in the past 5 years (according to PhilPapers, the largest database of philosophy articles).

At present, I have 21 pieces either published or forthcoming, all except one sole-authored. 16 are published or forthcoming journal articles, 1 is a book chapter, 4 are book reviews. Among the journal publications, 2 are in the top 5 generalist journals of philosophy, 5 are in the top 10, and 10 are in the top 20 (based on the Leiter Report 2022 ranking). I'm also in the process of completing a book manuscript on linguistic meaning. My work currently has 264 citations, with an h-index of 8, and i10-index of 7 (Google Scholar). Over the course of my 10-year career, I've given more than 60 talks/presentations in Europe and the USA, both invited and peer-reviewed.

I've won two highly competitive international grants, a Juan de La Cierva Formacion postdoctoral fellowship (2017-2019, University of Barcelona, €50 000) and a Lise Meitner grant for which I serve as the principal investigator (2022 - current, University of Vienna, €177 980).

I've organized two workshops and a symposium. My professional service includes serving as a member of the Editorial Panel for the philosophy journal Thought and as the category editor for PhilPapers.org for the categories Basis of Meaning, Aspects of Meaning and most of their subcategories. I've reviewed more than a 100 articles for philosophy journals. In addition to research, I possess extensive teaching experience, having taught 22 courses as the primary instructor at various universities.

I've also engaged the general public about philosophy by giving public lectures and interviews in Estonian about contemporary philosophy and publishing popular scientific papers on various aspects of it in the most important general academic journal of the country.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | SAVIC , OLIVERA |
| **Referencia:** | RYC2023-044284-I |
| **Correo Electrónico:** | o.savic@bcbl.eu |
| **Título:** | Drivers of Early Memory and Language Development |

**Resumen de la Memoria:**

I study learning, memory and language development in infants and young children. I aim to show how these cognitive processes develop in parallel and support one other. I combine multidisciplinary approaches from psychology, linguistics and computer science. I primarily gain insights from behavioral and eye-tracking experiments with infants and young children, with the aid of computational modeling, neurophysiological measures, and work with nonhuman animals.

I have published my work in top-tier scientific journals (7 first-author, 4 co-authored), 12 proceedings papers and 2 book chapters, and presented at over 40 international conferences. I am a Marie Sklodowska-Curie fellow at the Basque Center on Cognition, Brain & Language (BCBL) and I hold a Visiting Professor position at the Ohio State University (OSU) as a Principal Investigator on a 5-year R01 project funded by the National Institutes of Health (2024-2029; $3,624,995). I am an Academic Editor of the Psihologija Journal and a reviewer for various scientific journals and conferences. I teach the Speech and Language Acquisition postgraduate course at the University of the Basque Country (UPV).

Our memory stores our knowledge about the world and guides our reasoning, decisions and use of language. My PhD work highlighted neglected parallels between child and adult memory by providing robust behavioral and neuropsychological evidence that even adult memory is more grounded in association (lemon-tea) than similarity (lemon-orange).

In my post-doctoral work, I examined how the development of attention affects learning and memory across development. My published work (1) illuminates the role of the prefrontal cortex, (2) highlights limitations of existing computational models, and (3) demonstrates developmental trade-offs in memory between accurate generalization (adults) and memory flexibility (preschool children). This work led to my discovery of limitations in memory development through visual experience and inspired my independent line of research, which demonstrates that mere exposure to rich language input can foster semantic links in the memory of children and adults. However, what we implicitly learn from language changes with development. My work explains why these changes occur by establishing links between (1) language contributions to memory and (2) the development of associative learning.

My published work raises an intriguing possibility: Simple regularities in language may be the key driver of early memory organization. This hypothesis is controversial and has not yet been explicitly tested. The prestigious Marie Curie fellowship has enabled me to develop a project to test this idea in 9-18-month-olds, within which I have designed innovative tools to test early interactions of language and memory in mono- and bilingual infants. Most recently, I obtained 5-year multi-million funding (NIH R01, 2024-29) to examine how language exposure aids the development of semantic memory, learning and language comprehension in 4-9-year-olds.

I also lead an international project on developmental word associations, I supervise replications of my studies in other languages, and I am a Co-Investigator on a reading and memory development project submitted for ESRC funding (UK).

**Resumen del Currículum Vitae:**

am a Marie Sklodowska-Curie Fellow at the Basque Center on Cognition, Brain & Language (BCBL) where I lead a research line on infant language and memory development. I am a Visiting Professor at the Ohio State University (OSU), where I lead a research line on the developmental links between language exposure, semantic memory and language comprehension. I study how humans learn, how they represent what they have learned and how this changes through development.

I earned my PhD in Cognitive Psychology at the University of Belgrade (2015), where I worked under the supervision of Prof. Vanja Kovic. During my graduate studies I investigated the nature of semantic organization in adult humans. Parts of my thesis, The Nature of Conceptual Knowledge, were published in Acta Psychologica (2020) and PLoS ONE (2017).

In 2015, I was offered a postdoctoral position at the Cognitive Development Lab at the Ohio State University, to work under the supervision of Prof. Vladimir Sloutsky and investigate the role of attention in the development of visual category learning. This position (2015-2020) supported my transition to the developmental research, fostered a number of on-going fruitful collaborations and resulted in publications in leading journals in the field, such as Journal of Experimental Psychology: General (2019) or Cognition (2020).

In September 2020, I accepted a position of a Research Scientist with a Principal Investigator role at the Ohio State University. This position supported further development of my independent lines of research. From 2020 to 2023, I led research lines on learning mechanisms that drive early lexico-semantic development and how this development can be fostered by (a) the statistical structure of language and (b) regularities in visual input.

In 2022, I was awarded Marie Skłodowska-Curie Individual Fellowship to join the BCBL. In 2024, I secured funding from the U.S. National Institutes of Health as a Principal Investigator of a 5-year R01 project (2024-2029; $3,624,995) at the OSU.

I taught undergraduate courses in Learning and Memory (2012-13), Psychology of Learning (2013-15) and Memory and Cognition (2013-15) and I served as a visiting lecturer for an honours course in Psychology (2018-present). I teach the Speech and Language Acquisition postgraduate course at the University of the Basque Country (UPV).

I have a strong commitment to promoting science among young students and within communities with limited access to resources. I designed programs for promoting scientific literacy in elementary and middle schools in low-income communities, mentored talented high school students in developing research interests and wrote for a popular science magazine for young readers. I serve as an Academic Editor for Psihologija Journal (Serbian Psychological Association) and as a reviewer for a number of scientific conferences and journals.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | GREGORY , DANIEL |
| **Referencia:** | RYC2023-045819-I |
| **Correo Electrónico:** | daniel.gregory@plus.ac.at |
| **Título:** | Inner speech, dreams, memory, and beyond |

**Resumen de la Memoria:**

My research in the coming years will build on my existing expertise on the topics of inner speech, memory, and legal reasoning.

The centerpiece of my research will be a book on inner speech, providing a thorough treatment of the phenomenon. This book will revisit some issues I have previously considered, such as the ontology of inner speech and whether material from the philosophy of language applies to inner speech, and provide an updated assessment of them. However, it will also take up new issues, such as considering whether inner speech can be examined as a unified phenomenon, or whether we have to treat some kinds of inner speech distinctly.

I anticipate continuing to do work applying material from the philosophy of mind and cognitive science to legal issues. My next paper within this research project will explore how the law should deal with introspective error: What should happen, for example, if even a defendant did not realise that they had an intention to harm someone? I will then address a series of new questions within this project. For example, the law tends to assume that individuals act on the basis of fully-formed beliefs and intentions, ignoring the fact that some mental states are more refined than others. I intend to explore how the law should deal with individuals who have acted on the basis of less refined, or inchoate mental states.

I will continue to carry out work in experimental philosophy, in collaboration with empirical researchers. The most likely next step in this context is a second paper exploring lay intuitions on another thought experiment relevant to consciousness.

A major career ambition for me is to continue investigating important but unexplored philosophical issues and drawing attention to them. The next area I want to explore in this context concerns memory loss, specifically in dementia and similar diseases. I think there are a number of reasons that philosophers should think about memory loss as well. One reason is simply that the scientific research in this area may be an extremely valuable resource for thinking about issues in the philosophy of mind, in the same way that developmental psychology has been a valuable resource. More broadly, there are also questions to be taken up in moral and political philosophy, such as the particular kinds of responsibilities we have for people whose personal connections to family and to the community might be fading in a certain respect, but who remain full members of those groups. These latter issues have received some attention, but certainly not the attention they are due. I intend to explore all of these matters. The project will have especially high impact within philosophy, the mind sciences, and beyond, because of the relevance of diseases involving memory loss in an aging population.

**Resumen del Currículum Vitae:**

I have played a leading role in establishing a new subfield in philosophy of mind, investigating inner speech. I have written pioneering articles on this previously underexplored topic which appear in The Review of Philosophy and Psychology, The Journal of Consciousness Studies, Thought, Teorema, and Phenomenology and the Cognitive Sciences. I am also a co-author (one of two) of the first entry on inner speech in the Stanford Encyclopedia of Philosophy.

I have also published on dream skepticism (the question of what can justify the belief that one is awake and not dreaming) in Erkenntnis, offering a new solution. With Prof Kourken Michaelian, I am co-editing an anthology titled Dreaming and Memory: Philosophical Issues to appear in Springer's Synthese Library book series.

I have published in legal philosophy, applying material from the philosophy of mind to legal decision-making processes, and in experimental philosophy.

My research contributes to society significantly. My research on inner speech, including its relationship to verbal hallucinations (voice-hearing experiences), has been cited in research on mental health. My work on legal decision-making is directly relevant to legal practice.

I have individually received five major external grants, including a María Zambrano Postdoctoral Fellowship and a Humboldt Postdoctoral Fellowship.

Scientific and technical capacities which I have acquired range widely and go well beyond philosophical reasoning, including methods of empirical research and the skills necessary for interdisciplinary research.

Scientific responsibilities have included roles in organising workshops, colloquia, and a summer school; refereeing; teaching and supervising; mentoring; and editing the inner speech section on PhilPapers.

I have had a highly international career, involving periods of study or academic positions in six countries, namely, Australia, the United Kingdom, Germany, Switzerland, Spain, and Austria (from March 2024).

My work on a significantly underexplored topic, inner speech, is evidence of independence and intellectual leadership. I have also demonstrated practical leadership in organising events to draw other philosophers' attention to this topic. For example, I organised the highly successful online Inner Speech Colloquium in 2023, involving a series of 13 talks on the topic.

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I am committed to academic outreach. One hugely successful outreach project involved proposing and then co-writing a TED-Ed animation on the topic of dream skepticism. This lesson has been viewed over 1,000,000 times.

I am an extremely committed teacher, having convened 11 courses with full responsibility and two more with shared responsibility, at both the undergraduate and graduate level. I have been a highly effective supervisor of undergraduate theses. One former student is now a PhD student at MIT; another is a PhD student at LSE. I also played a major role in mentoring these and others students.

I have evaluated research as a referee of 22 articles, as well as co-editing the aforementioned anthology with Michaelian.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | DE DIEGO LAZARO, BEATRIZ |
| **Referencia:** | RYC2023-042856-I |
| **Correo Electrónico:** | bdiegola@gmail.com |
| **Título:** | Language learning and executive function in children with hearing loss |

**Resumen de la Memoria:**

My research focuses on language learning and effective language interventions for children with hearing loss, monolingual and multilingual. In my studies, I combine traditional behavioral measures with eye-tracking and electroencephalography (EEG) technology. My studies show that monolingual and bilingual children with hearing loss, including children with unilateral hearing loss, are at risk of language delays, which can negatively impact their academic outcomes. My research showed for the first time that learning a second oral language is not a risk factor for language development in children with hearing loss, yet many professionals still advise families to focus on the majority of language to the detriment of the home language. My studies provided insight into the relationship between the dominant and non-dominant languages and executive functioning and into the use of visual cues during language learning in children with hearing loss. In addition, I have shown that the use of narratives in language intervention is effective for word learning and syntax improvement in children with hearing loss.

**Resumen del Currículum Vitae:**

My research studies have resulted in the following scientific contributions: 14 peer-reviewed publications (most of them as first author and in Q1 and Q2 journals), 3 more currently under review, 20 national and international conferences (16 as a first author), 10 invited talks, 2 invited articles, and dissemination activities at schools and for the general public such as a talk at Semana de la Ciencia at the University of Valladolid. I have obtained competitive funding through 1 master's and 1 Ph.D. scholarship (La Caixa, $54,000+tuition), 9 international travel awards, 3 postdoctoral fellowships (La Caixa Junior Leader €295,000; Maria Zambrano program, €96,000; Beca Talento Madrid, €172,000), and six grants as a principal investigator. Two of these grants were dissertation grants, one from the Arizona State University Graduate Student Association ($500) and one from the Society of Research in Child Development (SRCD, $2,000). The remaining grants include the SRCD Early Career Award ($7,500), the Reducing Health Disparities grant from Midwestern University ($10,000), the Leonardo grant from the BBVA Foundation ($40,000), and La Caixa Junior Leader (€38,000 per year). Through my training and research experience, I developed skills for lab management, grant writing, data analyses, budget building, project management, and team building. These projects have been carried out in collaboration with 9 research assistants and collaborators from Spain and the USA. I have demonstrated leadership in my research by independently running my lab, creating a Study Abroad program to Nicaragua, and coordinating a multi-site project with different U.S. universities to investigate professional recommendations received by caregivers of bilingual children with hearing loss. In addition, I have mentored 12 undergraduate and graduate capstone and research projects. Some of these projects resulted in two Q1 peer-reviewed publications and several international conference presentations. My research has resulted in formal partnerships with public and private institutions such as Universities, schools, parental associations, or Centers for Educational Resources for Children with Hearing Loss. I am currently mentoring 2 undergraduate and 1 audiology doctoral capstone projects, and 2 Ph.D. students. I have been an Early Career Representative at SRCD since 2019. I am an editor at the Auditio journal and an editorial board member for two Q1 journals, the Language, Speech, and Hearing Services in Schools Journal and the Journal of Speech, Language, and Hearing Research. In addition, I was part of the organization and scientific committees of the Spanish Audiology Society (AEDA) 2019 Conference and the Education and Technology Conference 2023. I have 15 years of experience working as a speech-language pathologist and a teacher for the deaf in clinical and educational settings in Spain and USA.

| **Área Temática:** | **Mente, lenguaje y pensamiento** |
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| **Nombre:** | DELGADO RODRÍGUEZ, JANET |
| **Referencia:** | RYC2023-044839-I |
| **Correo Electrónico:** | jdelgadr@ull.edu.es |
| **Título:** | Bioética: de la vulnerabilidad a la resistencia moral colectiva |

**Resumen de la Memoria:**

Mi línea de investigación principal sobre vulnerabilidad y resiliencia moral en profesionales sanitarios comenzó como parte de mi tesis doctoral, en la que examiné las diversas formas en que se ha conceptualizado la vulnerabilidad en el campo de la bioética. Mi tesis fue codirigida por Martha Fineman, fundadora de Vulnerability and Human Condition Initiative, en Emory University (Atlanta). Aunque su teoría de la vulnerabilidad se desarrolla como un marco socio-jurídico, centra en la vulnerabilidad inherente a todos los seres humanos, mi tesis y posteriores investigaciones se han centrado en la aplicación de la teoría de la vulnerabilidad en el contexto de la bioética y, en concreto, de la atención clínica. He utilizado este marco teórico para destacar cómo todos los diferentes participantes en la relación asistencial (paciente y familia; profesionales sanitarios e instituciones) son vulnerables y cómo esto afecta a las relaciones entre ellos. El objetivo de este trabajo es comprender y articular mejor las complejas relaciones asistenciales implicadas para que las instituciones puedan cumplir con su responsabilidad de cuidar no sólo a los pacientes, sino también a los profesionales sanitarios. Así pues, mi investigación sobre la vulnerabilidad se relaciona con diversos aspectos de la experiencia de los profesionales sanitarios, como la angustia moral, el agotamiento y la resiliencia moral necesaria para hacerle frente.

En el contexto de la pandemia de COVID-19, continué esta investigación liderando un grupo de investigadoras de Canadá y Estados Unidos para analizar el impacto de la pandemia en la vulnerabilidad y la angustia moral de los profesionales. En este contexto, acuñamos el nuevo término "resiliencia moral colectiva" para caracterizar la capacidad compartida que surge del compromiso y el discurso mutuos en entornos grupales para responder a la angustia moral individual y crear un entorno de práctica ética. Hasta entonces, la bibliografía sobre la resiliencia moral se había centrado principalmente en los aspectos individuales, que pueden no ser suficientes para hacer frente a todos los nuevos retos. El concepto insta a los grupos a unirse, psicológica y conductualmente, para mantener la integridad moral. Esto es importante porque puede ayudar a los equipos o comunidades a resistir y superar los retos morales no desde un punto de vista individual, sino como acción colectiva. La noción de resiliencia moral colectiva surgió durante la pandemia de COVID-19 debido a la experiencia compartida de angustia moral entre los trabajadores sanitarios, pero trasciende el contexto de la pandemia y debe ser explorado de manera empírica en mayor profundidad. Actualmente, dentro del proyecto INEDyTO II, dirijo una línea de investigación cualitativa a través de entrevistas y grupos focales centrados en comprender las experiencias de los profesionales sanitarios que realizan diferentes prácticas al final de la vida. Estos hallazgos cualitativos serán cruciales para comprender mejor las opiniones y experiencias de los profesionales sobre la resiliencia moral colectiva, integrando los enfoques teóricos y prácticos. Mis intereses académicos se han centrado en dos áreas adicionales: el estudio de las cuestiones éticas, legales y sociales de las tecnologías sanitarias y la inteligencia artificial; y la ética de la donación y el trasplante de órganos.

**Resumen del Currículum Vitae:**

Defendí mi doctorado en Filosofía en 2018 en la Universidad de La Laguna, mientras compaginaba mi actividad académica con mi práctica enfermera a tiempo completo. Mi tesis doctoral se centró en analizar la relación entre los conceptos de autonomía y vulnerabilidad en bioética desde un marco relacional. Fue codirigida en la Universidad de Emory en Atlanta, EEUU, dentro de la Vulnerability and Human Initiative. He realizado mi formación predoctoral y postdoctoral en La Laguna, Atlanta, Nueva York, Leeds, Kobe, Tokio, Barcelona y Granada. Con ello, he adquirido experiencia y cierto reconocimiento internacional en el estudio de la vulnerabilidad en profesionales de la salud, particularmente en lo que se refiere al sufrimiento moral y la resiliencia moral. Mis intereses académicos se han centrado en dos áreas adicionales: a) el estudio de las cuestiones éticas, jurídicas y sociales (ELSI) de las tecnologías sanitarias, incluida la inteligencia artificial aplicada a la salud, y b) la ética de la donación de órganos y el final de la vida.

He publicado un total de 35 artículos científicos en revistas científicas, la mayoría de ellos en revistas líderes en mis campos de especialización. Desde 2019, he publicado 25 artículos (19/25) en el primer o segundo cuartil (Q1 o Q2). En total, tengo un índice h de 12 en Google Scholar (7 en Scopus) y 423 citas. Además, he publicado 6 capítulos de libro y 6 informes colectivos, 5 de los cuales son informes de Evaluación de Tecnologías Sanitarias (ETS) en cada uno de los cuales he coordinado el análisis de los aspectos éticos, legales, organizativos, sociales y ambientales, en el marco del Ministerio de Sanidad del Gobierno de España.

En 2016, recibí una beca de investigación sobre bioética de la Fundaciò Victor Grifols i Lucas. En este proyecto de un año, desarrollé las ideas principales de mi tesis sobre los aspectos relacionales de la vulnerabilidad y la autonomía en bioética. Dos años después de finalizar el doctorado, fui gestora del proyecto de investigación financiado por la Fundación BBVA sobre la Detección y eliminación de sesgos en algoritmos de diagnóstico y localización para COVID-19 (Universitat Autònoma de Barcelona). Actualmente, soy gestora de un proyecto H2020 de la UE, TTV GUIDE TX (19 socios de 7 países europeos), en el que la Universidad de Granada en uno de los principales socios. Gestiono la actividad de la Universidad de Granada como socio responsable de la sección Ethics and Governance del proyecto . Gracias a mi experiencia como investigador principal y gestor de proyectos de este tipo, puedo dirigir equipos interdisciplinares e internacionales, así como cooperar en la gestión de iniciativas de características similares. Además de mi actividad investigadora, he sido profesora asociada en la Facultad de Ciencias de la Salud de la Universidad de La Laguna, y actualmente soy profesora externa en el Máster de Bioética de la Universidad de La Laguna y de la Universidad de Las Palmas de Gran Canaria. Desde el año pasado codirijo la tesis de una estudiante de doctorado (segundo año) en la Universidad de La Laguna. También pertenezco al Grupo de Trabajo de Cuestiones Públicas de ELPAT (Ethical, Legal and Psychosocial Aspects of Transplantation), división de la ESOT (European Society for Organ Transplantation).También soy miembro del Instituto Universitario de Estudios de las Mujeres.

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| **Área Temática:** | Mente, lenguaje y pensamiento |
| **Nombre:** | POPA , ELENA |
| **Referencia:** | RYC2023-043790-I |
| **Correo Electrónico:** | elena.popa@protonmail.com |
| **Título:** | Causality and social determinants of health |

**Resumen de la Memoria:**

While there is a history of investigating how social conditions or psychological factors influence health, biomedical understandings of health and disease are still mainstream. Alternative conceptualizations such as the biopsychosocial model have been criticized for their vagueness. Nevertheless, recent medical work on social determinants of health and its philosophical analysis have pointed to the need to move beyond philosophical assumptions of a reductive ontology. This project aims to take a fundamental step in this direction by investigating how current concepts of causation apply to social determinants of health. The recent literature on causation distinguishes difference-making, mechanistic, and dispositional accounts and corresponding concepts of causation. The difference-making concept can spell out whether a social or psychological variable causes a disease independent from ontological considerations of inter-level causation. The mechanistic one can explain the how such variables are causally related, through the relevant entities and activities involves. The dispositional account can frame social or psychological states as predisposing one to health problems. A joint account will map out the roles each of these concepts play in a complex picture of determinants of health as biopsychosocial. The project will first explore ethical reasons for including social and psychological variables in causal models for health contexts, showing how these models can meet objectivity standards. Secondly, the three main sets of approaches to causality will be investigated in relation to social determinants of health within a pluralist framework. Lastly, the project will investigate case studies from psychiatry and public health, particularly health effects of inequality and the causal connection between agency and health. This is important in light of persistent criticism regarding the excessive focus on biomedical interventions in healthcare or health promotion. A clear account of how causality operates between social, psychological, and biological factors can help frame policies for health promotion or communicate health risks in a way that moves beyond assumptions reducing causality to physical or chemical processes.

**Resumen del Currículum Vitae:**

Following the completion of my PhD, I have published in the philosophy of science and philosophy of psychology in journals such as Synthese and Review of Philosophy and Psychology. I have also started a new research program specializing in philosophy of medicine, publishing in journals such as Studies in History and Philosophy of Biological and Biomedical Sciences, History and Philosophy of the Life Sciences, or Topoi. My article in Studies in History and Philosophy of Biological and Biomedical Sciences has been cited in the Stanford Encyclopedia of Philosophy as an emerging area of research. I have obtained funding from the European Comission and the Polish National Science Center for a project on philosophical aspects relevant to decision making in public health with several planed publications in this area. I have extensive experience in undergraduate teaching, including introductory courses in philosophy, logic, and ethics, as well as advanced courses in my areas of specialization and seminars for final year undergraduate students. I have also recently started co-supervising a PhD student at my current institution. I have also fulfilled several administrative roles in university setting including curriculum development, program structure, assessment, and recruitment. I am currently managing my own project, including financial and reporting issues in addition to the research. My long term goal is to secure a permanent academic position in Europe involving both research and teaching that would enable me to consolidate my position in the philosophy of medicine international community. The current fellowship would help achieve these aims by providing me with the necessary funding, academic environment , opportunity to teach and supervise, and overall stability.

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| **Área Temática:** | **Mente, lenguaje y pensamiento** |
| **Nombre:** | RUYANT , QUENTIN |
| **Referencia:** | RYC2023-042844-I |
| **Correo Electrónico:** | quentin.ruyant@gmail.com |
| **Título:** | A pragmatic perspective on relations between representation and reality |

**Resumen de la Memoria:**

My research mainly focuses on the relationship between representation and reality in science and on the pragmatic aspects of modelling activities. My doctoral research was dedicated to the defence of an original position in the debate on scientific realism: modal empiricism. Modal empiricism is a pragmatically oriented version of empiricism. It proposes to understand scientific knowledge as conveying communal norms of representation that are optimized for empirical success in all possible contexts. One of its main novelties lies in a notion of situated (or contextual) possibilities, that is, possibilities relative to a bounded situation, which, I argue, opens the way to an inductive epistemology for modalities. In my PhD thesis, I argue that Modal Empiricism provides a better account of the rationality of scientific practice than traditional empiricism, in particular the way scientists explore possibility space in experiments, that it fares better than scientific realism against problems of theory change, and that it can account for the success of science just as well. In 2021, I published "Modal Empiricism: Interpreting Science Without Scientific Realism", a book based on my PhD thesis reviewed in light of my more recent work on scientific representation.

After my PhD, I oriented my research towards the topic of scientific representation, which is concerned with the relationship between scientific models and the systems they represent, and the role played by modellers in establishing this relation (i.e. the semantics and pragmatics of scientific models). I have argued for an the existence of two levels of analysis for scientific representation, taking inspiration from Grice's theory of linguistic meaning: a contextual level associated with the aims of particular model users and a communal level associated with norms of use in the epistemic community. I have proposed to transpose tools from pragmatics in philosophy of language in order to understand them, notably indexicality. I have drawn on this approach towards scientific representation to examine the prospects of perspectival realism and to advocate for pragmatist interpretations of symmetries in physics. I have also been interested in the interpretive problems of quantum mechanics since I started doing philosophy and have regularly published on the topic, notably on perspectival and relational interpretations, also addressed in light of my research on scientific representation.

My methodology, which consists in bridging linguistic pragmatics and scientific representation, has proved very fruitful so far. I plan to pursue this line of investigation in the future by transposing the hyperintensional notion of aboutness (or subject matter) from philosophy of language to philosophy of science. This notion has been used to account for linguistic phenomena associated with relevance and intentionality, and I think that it could equally serve to account for the intentionality of representational activities in science and for the relations between concrete and abstract representations in a fine-grained way, so as to develop a pragmatist conception of scientific theories. I am convinced that this could shed light on a large variety of topics, including questions of inter-theory reduction, the relation between pure and applied science, or the role of social values in scientific theorising

**Resumen del Currículum Vitae:**

I have published one book, 12 articles in a variety of high quality journals and presented my work at 24 international conferences and congresses.

My initial education as an engineer allowed me to develop strong foundation in a variety of scientific fields and sparked my enthusiasm for the philosophy of science. After an initial career as an engineer, I pursued a master's degree in philosophy followed by a doctorate. My doctoral research was dedicated to the defence of an original position in the debate on scientific realism. Various aspects of this work have been presented on multiple occasions at international conferences and congresses and led to publications, notably in the British Journal for the Philosophy of Science, currently the leading journal of philosophy of science. In 2021, I published a book based on my thesis reviewed in light of my more recent work at Springer Nature.

After my PhD, I did a research stay at Utrecht University on perspectival quantum mechanics. Then I obtained in 2019 a two-year post-doctoral contract at UNAM for a project on scientific representation. In 2021, I obtained a Marie Skłodowska-Curie grant for a two-year postdoctoral stay in UCM under the supervision of Mauricio Suárez, a renowned philosopher of science who did ground-breaking research on scientific representation. My main contribution to the topic has been the transposition of tools from linguistic pragmatics to scientific models. This ongoing research has led to numerous presentations in international congresses and conferences across America and Europe, and to publications in first rank philosophy journals, including Philosophy of Science, the European Journal for the Philosophy of Science, Synthese and Studies in History and Philosophy of Science.

In 2022, I organised an international workshop in Madrid , and in 2023 a symposium at the EPSA congress, with talks from renowned philosophers, including Thimothy Williamson, Michela Massimi, Mauricio Suárez and Roman Frigg. I have also been a referee for many journals, including the British Journal for Philosophy of Science, European Journal for Philosophy of Science, Erkenntnis and Synthese.

I started lecturing to undergraduate students during my PhD at Université de Rennes 1 in 2013, with lectures on the metaphysics of physics and scientific realism. In 2018, I led a seminar on Analytic Philosophy of Language at UCLouvain, I gave an introductory lecture series on Philosophy of Science to 200 students reading science and I co-organized a seminar for 300 medicine students. During my post-doctoral fellowship at UNAM, I taught specialized courses in English and Spanish on scientific representation and scientific explanations for postgraduate students in philosophy of science, some of which online. I supervised an undergraduate thesis and was part of the monitoring committee for a Master these. I am now part of the doctorate monitoring committee of a UNAM student. Last year I taught an introductory course on scientific realism in Spanish for undergraduate philosophy students at UCM.

I have always been eager to share my knowledge and enthusiasm for philosophy. Since my PhD, I have maintained a blog on the popularization of philosophy of science, and have participated in podcasts and conferences for a general audience. I have written magazine articles and encyclopedia entries.

**Resumen de la Memoria:**

I am an experienced and highly self-motivated telecommunication engineer that started her research in the imaging cardiovascular field 15 years ago. After my telecommunication engineer degree (2010), I specialised on image processing of microscopy images of cardiac tissue after which I obtained a competitive PhD grant to pursue my PhD. During my time as a PhD student (2012-2015), I had the opportunity to be involved in a multidisciplinary environment with clinicians, biologists and engineers to develop and translate computational techniques into the clinical environment. After finishing my PhD, I started a new research line in cardiovascular imaging and morphology using synchrotron-based X-ray Phase-contrast Imaging (X-PCI). In 2016, I spent 6 months as visiting postdoctoral researcher in TOMCAT beamline at SLS (Switzerland) and learned all the basic principles of synchrotron-based X-PCI. During my time there, I participated in the development of the multiscale X-PCI scanning protocol that allows to obtain details on the micro-structural organisation of cardiac tissue and its integration within the whole macro-structure, in 3D and non-destructively.

In January 2017 I joined the Cardiac Morphology group at the University College London (UK) working on the detailed analysis of myocardial architecture of human fetal hearts with different congenital heart diseases (CHD) using synchrotron X-PCI, as well as high-resolution episcopic microscopy images of mice hearts. Thanks to our novel high-resolution synchrotron X-PCI technique, we have quantified in detail and for the first time, alterations on fetal myocardial architecture, such us disorganisation of myocytes, on human fetal hearts with different CHDs. In July 2019 I returned to Barcelona, and I joined the Translational Computing in Cardiology group at IDIBAPS and became deputy group leader and responsible of two of the research lines of the group: Synchrotron-based X-PCI and Computational modelling of the cardiovascular system. I was awarded 1 of the 60 prestigious Beatriu de Pinós reintegration grants (2020-2022) to work on the implementation of advanced computing tools for the characterisation of cardiovascular remodelling in different abnormal fetal conditions such as CHD, including computational modelling of the fetal/neonatal circulation and its remodelling, as well as machine learning (ML) algorithms for aiding clinicians in the diagnosis and management of CHD. In 2022 I started a new position in Hospital Sant Joan de Déu as data scientist and leader of the eCare team, to develop ML algorithms for the risk stratification of children with CHD after cardiac surgery as well as to predict the risk of cardiotoxicity in children with cancer. I have been recently awarded 2 projects as principal investigator from competitive national calls (279000€).

During my research career, I have secured all the necessary research funds to pursue my PhD and to continue my own post-doctoral research. I have also gained extensive experience in computational, image analysis and machine-learning methods for cardiovascular applications. I have learned to combine my engineering background with medical image interpretation and physiological modelling to analyse pathological conditions using state-of-the-art tools, ultimately targeted to clinical applications.

**Resumen del Currículum Vitae:**

Dr Garcia-Canadilla is an electrical engineer with +10 years of experience as a biomedical engineering researcher in the fetal and paediatric cardiovascular field. She received her PhD in Information and Communication Technologies by Universitat Pompeu Fabra (UPF) in 2015 (Cum Laude and international mention). In September 2012 she was awarded a predoctoral fellowship by the Instituto de Salud Carlos III to carry out her PhD studies. She received a MSc degree in Biomedicine from Universitat de Barcelona in 2011. She graduated in Electrical Engineering by the Universitat Politecnica de Catalunya in 2010. During her PhD studies she did a research stay of 3 months in LaBS-Politecnico di Milano (Italy) to implement a finite element electromechanical model of a cardiac cell. After her PhD, she did a 6-month post-doctoral research stay (July-December 2016) at the Paul Scherrer Institute (Switzerland). Then, from 2017 until June 2019 she was a post-doctoral researcher at the Institute of Cardiovascular Science of the University College London (UK) working on the analysis of high-resolution synchrotron images of fetal hearts with congenital heart disease (CHD) under the supervision of Prof. Andrew Cook. She was awarded with 2 different grants to do both international post-doctoral research stays. On 2019, she was awarded a Beatriu de Pinos grant (MSCA cofund) for 3 years (2020-2022). She is currently a postdoctoral researcher at Hospital Sant Joan de Déu. As a result of her research, she has published +90 papers including journals and international conferences abstracts. According to Google Scholar, her work has received 745 citations and her h-index is 16. She has been invited 14 times to give talks in several national and international conferences, workshops and courses. She has also presented her work in +50 national and international conferences.

During her career as biomedical engineering researcher she has successfully established several national and international collaborations: Andrew Cook (UCL, UK), Anne Bonnin (PSI, Switzerland), Maja Cikes (University of Zagreb, Croatia), Jose Novo (Royal Veterinary College, UK), Tim Mohun (The Francis Crick Institute, UK), Gabriella Captur (UCL, UK), Georg Hansmann (Hannover Medical School, Germany) among others, and has participated in many international projects. Moreover, she has worked as associated teacher in UPF from 2013. She has co-supervised 1 PhD student and 3 MSc thesis: 1 at UPF, 1 at UB and 1 at UCL, and 1 MSc semester project at ETHZ (Zurich). She has also co-supervised 10 BSc students: 2 at UCL, 5 at UPF and 3 at UB. She is currently co-supervising 2 PhD on the topic of cardiovascular image analysis, modelling and machine learning.

While being a technical person, she is very interested in understanding and addressing the underlying biomedical problems and therefore able to propose the right approaches keeping in mind the biomedical/clinical relevance. She is also able to interact professionally with an interdisciplinary team involving engineers, biologist and medical specialists. Her main research focuses on the development of computational models of the fetal/neonatal cardiovascular system; advanced image analysis of cardiac structure; implementation of machine learning algorithms for improving clinical decision making & risk stratification in fetuses/children with CHD.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | OURO BARBA, PABLO |
| **Referencia:** | RYC2023-043451-I |
| **Correo Electrónico:** | pablouro@gmail.com |
| **Título:** | Simulacion de flujos turbulentos para turbinas de energia eolica offshore y mareomotriz |

**Resumen de la Memoria:**

I graduated in MEng in Civil Engineering from University da Coruña with first-class honours in 2013, including a full year at Chalmers Institute of Technology in 2011/12 and a dissertation focused on turbulence modelling with shallow water models (10/10 mark). I did my PhD in the Hydro-Environmental Research Centre at Cardiff University (2013-2017) which has an international reputation in hydraulics and renewable energy research. During my PhD I developed a cutting-edge numerical solver in application of horizontal and vertical axis tidal turbines, resulting in a total of 7 journal papers published in Physics of Fluids, Journal of Fluid Mechanics or Computers and Fluids, among others. My following position was Research Software Engineer in the Supercomputing Wales for 18 months, period over which I developed new skills and knowledge in high-performance computing that has become invaluable for the speed-up and refinement of my in-house code DOFAS. This is now one of the most advanced numerical tools for the large-eddy simulation of offshore wind farm, tidal stream turbines and environmental turbulent flows. This post allowed me to consolidate a strong profile in fluid mechanics and high-performance computing.

Since January 2019 until August 2020 I was appointed as Lecturer in Computational Hydraulics at Cardiff University, when I developed new skills in teaching, student supervision, secured competitive funding for PhD students (EPSRC CASE DTP, estimated value of 65k GBP), led a group of PhD students and two post-doctoral researchers, and expanded my research expertise to new, interdisciplinary areas such as microplastics and fish behaviour together with a special focus on contributing to the UN's Sustainable Development Goals. Five years after, these areas of research continue with collaborations with colleagues from UK, Germany, Brazil, Colombia, Spain or The Netherlands. In 2019 I was selected together with other 19 early-career researchers from Bath, Exeter Bristol and Cardiff as member of the GW4 Crucible in Digital Innovation which provided invaluable training to engage with policymakers and establish multidisciplinary collaborations. In 2019 I obtained the Contratado Doctor certificate by ANECA.

In 2019 I was personally invited by Prof Tim Stallard to apply to the prestigious Dame Kathleen Ollerenshaw Fellow at the University of Manchester, which I was awarded and started on September 2020. Only 2 applications out of 80 were funded for this scheme. This is my current position in which, as research fellow, I lead the research activity on offshore renewable energy, high-performance computing in fluid dynamics and hydro-environmental turbulent flows, which is aiding me to have a stablished reputation in the UK and growing profile internationally. I lead national research projects collaborating with international industry partners and key stakeholders in relation to offshore wind farm wakes and environmental impacts, tidal turbine array designs and solar photovoltaic farm aerodynamics supporting the transition to net-zero economies.

To-date I have published 43 journal papers in top journals including Journal of Fluid Mechanics, Monthly Weather Review and Scientific reports (lead/corresponding author in 26 of these), and 7 further papers currently under review. I have authored 3 book chapters and contributed to over 50 conference pa

**Resumen del Currículum Vitae:**

In 2015, I received the prestigious John F Kennedy award from the IAHR at their 26th World Congress in The Hague. In 2016 I obtained a poster prize at the most important fluid mechanics event in the UK (Osborne Reynolds Award) and in its 2017 edition I was finalist and provided an oral presentation with another five candidates selected from other UK universities. Other minor prizes were obtained during the Tidal Energy Workshop at the University of Oxford in 2019 or Otter trophy from CIWEM in 2014.

I have been extremely proactive when setting up new collaborations with colleagues from the UK and beyond, proven by the excellent record of multi-disciplinary research with experts from the fields of biology (fish behaviour in turbulent flows and near hydrokinetic turbines), atmospheric science (microclimatic impacts of offshore wind farms), or hydrologists (micro-plastic and sediment transport). I have independently established collaborations with international universities (Karlsruhe Institute of Technology, Delft University, University da Coruna, CSIC, Nagasaki University, Hiroshima University, Sherbrook University…) and from the UK (UCL, University of Aberdeen, Cardiff University, Edinburgh University, Oxford University…).

I have a track record of success with securing research project funding, with more than 1.4M GBP to-date, of which 290k GBP correspond to projects where my role was PI. Since my appointment as DKOF, I have secured a 75k GBP industry project funded by the Offshore Wind Accelerator Carbon Trust, lead of the N8 network in environmental impacts of offshore renewable energy infrastructure (30k GBP), secured access to ARCHER2 from EPSRC and UK Turbulence Consortium calls with a notional cost 150k GBP, internal Co-I in the Supergen ORE Impact hub (480k GBP led by Prof Stallard) and, in 2022, shortlisted and in the final reserve list of the prestigious Royal Academy of Engineering Research Fellowships (500k GBP) but unfortunately was not successful due to the lack of funding from BEIS. These grants built on previously successful grants at Cardiff University. These include an EPSRC Standard Grant (370k GBP) with UCL and Cardiff University and an EPSRC ICT Discipline hopping in which I was co-investigator. I have led three projects at Cardiff University for a total of 100k GBP to support the development and deployment of renewable energy for remote communities in developing countries in collaboration with colleagues from Brazil and Colombia.

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| **Área Temática:** | Producción industrial, ingeniería civil e ingenierías para la sociedad |
| **Nombre:** | LLOBET SIXTO, JORDI |
| **Referencia:** | RYC2023-043765-I |
| **Correo Electrónico:** | jordi.llobet@gmail.com |
| **Título:** | Integrated NanoStructures & Electronic Devices |

**Resumen de la Memoria:**

My research line INTEGRATED NANOSTRUCTURES & ELECTRONIC DEVICES focuses on the modelling, design, investigation, and development of cutting-edge micro and nanofabrication technologies to advance the field of electronic devices and nanostructures. This research line not only aims to push the boundaries of nanofabrication and nanoelectronics but also fosters collaborations across diverse fields including quantum technologies, nanomechanics, photovoltaics, and biosensors. This research line opens avenues for large-scale multidisciplinary collaborations, positioning itself at the forefront of innovation in nanotechnology. By integrating expertise from various disciplines, I will address pressing societal challenges in energy, health, and future information processing systems.

The Ramón y Cajal fellowship presents an opportunity to establish a dynamic research group dedicated to tackling these challenges. Through this fellowship, I aim to drive impactful research activities focused on:

1. ADVANCED ELECTRONIC DEVICES FOR QUANTUM TECHNOLOGIES AND BIOSENSING: Developing state-of-the-art electronic devices tailored for applications in quantum technologies and biosensing, paving the way for transformative advancements in these fields.
2. ENHANCED FUNCTIONAL SURFACES FOR PHOTOVOLTAICS: Innovating novel approaches to enhance the functionality of surfaces in photovoltaic systems, aiming to boost efficiency and sustainability in solar energy conversion.
3. ADVANCED MICRO/NANO-SYSTEMS FOR MATERIAL SCIENCE: Advancing micro and nano-systems for material science applications, enabling precise characterization and manipulation of materials at the nanoscale for improved understanding and innovation in material science.

During my PhD tenure from 2013 to 2016 at IMB-CNM, under the guidance of Prof. F Pérez-Murano and Dr. Xavier Borrisé, I specialized in pioneering a novel method for fabricating advanced nanoelectronic and nanomechanical devices through ion beam implantation.

In 2017, I transitioned to INL (Portugal) as a postdoctoral researcher to spearhead a new research direction in nanofabrication tailored for industrial applications, while also making significant contributions to fundamental research. Here, my involvement in various projects centred on nanofabrication and nanodevices honed my expertise.

Returning to IMB-CNM in 2020 as a Principal Investigator, I secured a prestigious Marie Skłodowska-Curie – Beatriu de Pinós fellowship. In this capacity, I led the development of a semiconductor Si nanowire (SiNW) platform, pioneering its application in both qubit experimentation and biosensing.

In 2022, I embarked on a new chapter at ALBA synchrotron, empowered by a Marie Skłodowska-Curie (IF) fellowship. Here, I orchestrate a multidisciplinary endeavour amalgamating nanofabrication, material growth, and X-ray synchrotron techniques. This project is dedicated to imaging magnetic domains at the nanoscale on emergent epitaxial and 2D materials, underscoring my commitment to advancing cutting-edge research at the intersection of multiple disciplines.

**Resumen del Currículum Vitae:**

I received my PhD degree in Material Science from the UAB in 2016. My research has been conducted at Alba Synchrotron (Sp, 2022-currently), IMB-CNM CSIC (Sp, 2021-22), INL (Pt, 2017-21), at IMB-CNM CSIC (2013-17), and three short international research stays.

I am leading my research line INTEGRATED NANOSTRUCTURES & ELECTRONIC DEVICES on micro & nanofabrication technologies, from fundamental research to industry. I am developing and applying new methods for nanotechnology, contributing to the areas of NANOELECTRONICS; NEMS/MEMS and ENHANCED FUNCTIONAL SURFACES.

Achievements:
- Received funding for 16 R&D projects (FP7, H2020, Spanish, and Portuguese) totalling > 2M€ (3 as PI, 5 as WP leader).
- Led 13 RDI projects in collaboration with industry.
- Highly competitive Marie Skłodowska Curie - IF ('22-'24)
- Awarded 2 Beamtimes (graded A+, calls: '22, '23)
- Highly competitive Marie Skłodowska Curie - Beatriu de Pinós ('21-'22) fellowships.
- Awarded "INL Seed Grant" ('20-'21).
- 1st prize in IBM & SwissLitho "Young Investigator Idea contest" ('16)
- Classified as "Reserva" in the Ramón y Cajal calls ('21, '22) and awarded 1st position - Juan de la Cierva In. "Ing. Prod. industrial" ('19 call).
- Received MSCA IF - Seal of Excellence EU high-quality certificate ('18).

Publications and Conferences:

• Co-authored 49(+2) Journal Papers (21 as first/second author, 22 without PhD advisors). Total citations: 876; h-index: 16; i10-index: 25 (Google Scholar).
• Contributed to international conferences with 75 works (41 as first author, 43 oral contributions, and 24 as corresponding author).

Supervision, Teaching, Evaluation and dissemination:
• Supervisor of 1 Ph.D. thesis, 2 Master's Theses, 2 TFG. Hosted an international research stay.
• Teaching at UAB: Bachelor's Degree in Nanoscience & Nanotechnology and also Master in Advanced Nanoscience & Nanotechnology.
• Evaluated 3 Ph.D. theses and 4 Master theses.
• Member of evaluation committees for Marie Skłodowska Curie – Martí Franquès Doctoral Fellowships and ICTS IMB-CNM cleanroom access grants.
• Reviewer for Microelectron. Eng. (Elsevier), Nanotechnology (IOP Science), JM3 (SPIE), JMEMS (IEEE), Nanomaterials (MDPI), and Reviewer board member for Micromachines.
• Participation regularly in dissemination and outreach activities for general audiences, students, and industries

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Producción industrial, ingeniería civil e ingenierías para la sociedad
**Nombre:** PALMERO RODRÍGUEZ, ESTER MARÍA
**Referencia:** RYC2023-042484-I
**Correo Electrónico:** estermpalmero@gmail.com
**Título:** Advanced fabrication techniques of multifunctional materials

**Resumen de la Memoria:**

Along my research career my work has been focused on two main research lines, which I initiated from scratch at IMDEA Nanociencia (Juan de la Cierva Incorporación fellow since 2022, and obtaining the R3 Certificate in 2023) after joining the Group of Permanent Magnets and Applications in 2017:
(i) development of tuned composites and functional and efficient components by advanced techniques (e.g., additive manufacturing) for energy and transport;
(ii) synthesis of nano- and micro-structures by electrochemistry for sensors and microdevices in medicine, information technology and energy applications.

The international relevance of these research lines is manifested by their contribution to 7 EU projects (2 M-ERA.NET, 2 H2020 FET-Open, 1 H2020 Innovation Action, 1 HORIZON EUROPE and 1 EIT RawMaterials), the international research stay at the Fraunhofer IPA (Germany) that I am carrying out since 2023, and fruitful international collaborations with:
- research institutions: IPSAS (Slovakia), ILL (France), Univ. Le Mans (France), IFW-Dresden (Germany), Peking Univ. (China), JSI (Slovenia), Univ. Duisburg (Germany), USF (USA).
- and industry: Boston Scientific (Ireland), Höganäs (Sweden), BOSCH (Germany), METALPINE (Austria), KOLEKTOR (Slovenia), LCM (UK).

The work carried out in these research lines and in the frame of the projects UWIPOM2 (FET-Open) and PASSENGER (H2020 Innovation Action) have been successfully evaluated by the European Commission's Innovation Radar showing their potential for industrial development.

My research activities have led me to be co-author of 34 scientific publications, 2 patents and more than 80 contributions to international conferences, seminars and workshops (12 as Invited Speaker).
Along my postdoctoral period I have been supervising 5 PhD, 2 MSc and 1 BSc thesis works related to the preparation of composites with specific properties, synthesis of nanostructures, nanostructuring of permanent magnet materials, and fabrication of functional objects by several additive manufacturing technologies for high-tech sectors.

The knowledge and expertise gained in advanced manufacturing will be applied to develop the proposed research line: New generation of energy storage devices. Batteries are one of the most important and widely used electrical energy storage devices, boosted by the increased energy consumption, the progressive migration from fossil to electric energy, and the demand of low-carbon emission technologies. A new generation of efficient batteries based on resources widely available in Europe is needed for a sustainable energy transition in the frame of the European Commission Green Deal by 2050.

The main objective of the proposed research line is to develop a next generation of high efficiency and sustainable electrical energy storage devices through:
a) Synthesis of new materials, based on abundant raw elements.
b) Development of advanced multi-material manufacturing processes to fabricate a full battery with enhanced efficiency by optimizing its design.

Nowadays, the challenge is to develop a sustainable fabrication process of full batteries (instead of fabricating the components separately for being assembled). This will be possible in this new research line by combining 3D-printing and electrodeposition and profiting from a smart and sustainable use of materials and designed architectures.

**Resumen del Currículum Vitae:**

Degree in Industrial Engineering (2010) and PhD in Advanced Materials and Nanotechnologies (2016), awarding the Extraordinary Doctoral Award by Universidad Autónoma de Madrid. Since 2022 I am Juan de la Cierva Incorporación fellow at IMDEA Nanociencia and in 2023 I got the R3 Certificate. Since 2023 I am performing a research stay at the Fraunhofer IPA (Germany).

Main achievements done during the last years as post-doctoral researcher:

- Responsible of: electrodeposition and MEMs fabrication in the H2020 FET-Open project UWIPOM2 (2019-2023), aiming to develop micro-robotic mechanisms for microsurgery; bonding technologies of permanent magnet materials in the on-going H2020 Innovation Action project PASSENGER (2021-2025) and HORIZON Innovation Action project PLOOTO (2023-2025); and synthesis of nanostructures and nanostructured systems with tuned properties by electrochemistry as model systems for the development of permanent magnet materials in the on-going industrial contract with the company BOSCH (2022-2025).

- First time reported fabrication of a magnetic filament (meters long) for 3D-printing prepared from a solution casting composite for efficient fabrication and devices performance. This result, in addition to scientific publications, received coverage media (La Vanguardia, AZoM...) and was highlight in project NEXMAG awarded as Success Case by the M-ERA.NET Network in 2018.

- Responsible of the Processing and Characterization of Multifunctional Materials Lab (Ref. 436 in Labs and Infrastructures Network, Regional Government of Madrid).

- At a national level, I am PI of the project 3D4ENERGY, PI of the 2 on-going projects NEXUS (RETOS) and RETAIN (Transición Ecológica), and have been Co-PI of the project 3D-MAGNETOH (RETOS) and PI of two synchrotron projects at the SLS-PSI (Switzerland) and ALBA (Spain) synchrotrons.

- Technology transfer activities:
1 industrial contract with BOSCH (Germany).
2 industrial contracts (co-PI) with Höganäs AB (Sweden).
1 Cheque Innovación (co-PI) by Comunidad de Madrid with RAMEM S.A.
2 industrial collaborations (co-PI): IMA (Barcelona) and Urban Mining (USA).
1 European Patent Application: Miniaturized wireless powered actuator for in body medical applications (Ref. 21382782.7).

- PhD Thesis direction (5 in total): director of a PhD student funded by a FPI grant in the frame of the Severo Ochoa program, and co-director of 4 PhD students (1 defended + 3 on-going), two of them with full sponsorship by the companies Höganäs AB (Sweden) and BOSCH (Germany), respectively. Attraction of talent: one of the PhD students (from Cambridge University, UK) awarded in 2020 an INPhINIT fellowship from "la Caixa".

- 2 MSc thesis and 1 BSc thesis co-direction.

- Publications: 16 scientific papers (+1 submitted +5 in preparation), 1 review paper in preparation, 2 book chapters.
General indicators of quality of scientific production: h-index: 18, Citations: >720 (Source: Scopus)

- Contribution to international conferences and workshops: over 80 (12 as Invited Speaker): 2023 LAW3M, IEEE 2021 AtC-AtG, REPM2021, AIM2020, E-MRS Spring Meeting 2018, among others.

**Resumen de la Memoria:**

My scientific background covers a broad knowledge in the fields of environmental fluid dynamics, hydrodynamic modeling, water resources, and water quality. My research focuses on understanding physical processes (mixing and transport) in freshwater bodies as one of the most important drivers of ecosystem well-being. I have conducted field, laboratory, and numerical experiments which have equipped me with skills that range from experimental to computational.

During my Ph.D. at the University of Granada, Spain (2014), I obtained a competitive FPI Doctoral grant awarded by the Spanish Ministry of Science (2009) to lead field, laboratory, and modeling experiments to advance our understanding of the inflow-lake dynamics in stratified Mediterranean reservoirs, providing valuable insights for water management. During my two post-docs at the University of California Santa Barbara, CA, USA (2014-2019), I improved our understanding of under-ice transport and mixing through field observations and modeling, an under-study area of research; and I identified important environmental drivers (advection, convection, and changes in lake level) to include in mechanistic modeling frameworks of greenhouse gas (GHG) emissions from arctic and tropical lakes. My contribution was essential to predict future GHG emissions under climate change scenarios. These projects were funded by the National Science Foundation (NSF) and NASA, respectively.

In 2019 I was appointed as Senior Researcher and Project Manager at the University of California Davis (UC Davis), where I became the lead of a research team and diversified my research area by incorporating aspects of water quality and remote sensing into my experimental and numerical hydrodynamic work. UC Davis is one of the world's leaders in water resources and it allowed me to create a unique network of collaborators with private, state, and federal agencies managing water resources. Key tools for development during this phase include the development of predictive modeling tools to evaluate remediation strategies in collaboration with California Natural Resources Agency, and the development of a 3D hydrodynamic and biogeochemical model for Lake Tahoe to simulate water clarity funded by Tahoe Regional Planning Agency. I am currently the lead PI of a development project to implement a remediation strategy in Clear Lake, CA, which will require hydrodynamic modeling for scenario testing.

I would like to focus the research line of the Ramon y Cajal grant on assessing and predicting the rise of cyanobacterial harmful algal blooms (CHABs), which pose significant threats to human health and aquatic ecosystems. Attention has been paid to the formation of CHABs due to nutrient inputs from external sources (rivers), but the effect of nutrient inputs from the sediments (internal loading) during periods of low dissolved oxygen (hypoxia) is still an active area of research. My goal is to establish a global monitoring and predictive network for CHABs in reservoirs with the potential of being hot spots for CHABs due to their susceptibility to becoming active sources of internal loading during hypoxic periods caused by strong stratification driven by climate change. This research will combine field monitoring, statistical models, and predictive numerical models, allowing the development of operational risk management plans.

**Resumen del Currículum Vitae:**

I graduated in Agricultural Engineering at the Polytechnic University of Madrid (Spain) in 2007. Then, I completed a Master's degree in Water Management at Cranfield University (United Kingdom), in 2008. I conducted my Master's thesis in the private sector at TPC Ltd Sugar Cane Plantation (Moshi, Tanzania). Shortly after, I became a Technical Officer at the Environmental Agency (United Kingdom). Then, I completed a Master's degree in Environmental Hydraulics at the University of Granada (Spain) in the Department of Civil Engineering in 2010. After that, I joined the University of Granada Computational Limnology Lab to complete a Ph.D. in Environmental Fluid Dynamics. During my Ph.D. I conducted a 3-month research visit at the University of Toronto in the Environmental Fluid Dynamics Lab (Canada) in 2012. In 2014, I was hired as a Postdoctoral Researcher to lead the field work in ice-covered water bodies as part of the Arctic Long-term Ecological Research (LTER) at the Marine Science Institute at the University of California Santa Barbara, CA, USA. In 2017, I started my second Postdoctoral appointment at the Earth Research Institute in Santa Barbara, CA, focusing on tropical flood plains. In 2019, I accepted my current position at the University of California (UC) Davis (CA) as a Senior Researcher and Project Manager in the Department of Civil and Environmental Engineering. Since 2023 I have become an independent Senior Researcher leading my own research team.

Since 2014, I have published 32 peer-reviewed publications, 7 as the first author. My publications were cited ~180 times per year during the last 3 years. My goal is to publish my research in the top-quality journals of my discipline (water resources, engineering, physics, limnology, computer sciences, and environmental sciences). My publications have attached a total citation count of >800 citations, corresponding to an h-index of 16. I have actively engaged in conferences and workshops all over the world. During the last 10 years, my contributions have been mostly oral presentations, and during the last 4 years as an Invited Speaker.

I have participated in 10 research projects and 2 contracts using observations and modeling tools for future predictions of water quality response in lakes and reservoirs. Many of the end-users of my projects are from the USA and California, such as the Tahoe Regional Planning Agency (TRPA), and California Natural Resources Agency (CNRA), among others. During my research career, I have been a Senior Researcher in 5 different projects ($3.1M), co-P.I. of 2 projects ($3.6M), and P.I. in 2 projects ($1.1M). As a major accomplishment, I am currently the lead P.I. of a development project to implement a remediation strategy in Clear Lake ($1,1M) funded by CNRA.

During my Ph.D., I have led hands-on sessions in the Water Quality and Technology MSc Program at the University of Granada in Spain. I also co-supervised two Final Degree Projects. Since 2014, I have trained more than 10 visiting researchers, trained and mentored 8 undergraduate students, 4 Master students, and 3 Ph.D. students. I currently supervise a Junior Specialist. I am co-teaching the Senior Design course in Water Resources at UC Davis. I have also participated as an Invited Lecturer in undergraduate courses in the Civil and Environmental Engineering Degree at UC Davis.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | ISLAM , MONSUR |
| **Referencia:** | RYC2023-043167-I |
| **Correo Electrónico:** | monsurislam79@gmail.com |
| **Título:** | Design and manufacturing of advanced materials for bio-applications |

**Resumen de la Memoria:**

I am a dedicated researcher with extensive international experience in India, the USA, Mexico, Germany, and Spain. My research primarily focuses on the multiscale design and processing of carbonaceous materials for diverse biomedical and biotechnological applications.

I earned my Ph.D. from Clemson University, USA, in 2018, where I pioneered an origami-inspired process, securing a US Patent, for fabricating lightweight, strong, and electrically conductive 3D shapes of carbon, metal/carbon composites, and carbides. This innovative process transformed simple paper folding into an engineering technique for fabricating porous, lightweight, strong, and electrically conductive carbon structures. I also developed a dielectrophoresis device featuring 3D carbon microelectrode arrays, which were further demonstrated for microfluidic sample preparation applications for healthcare diagnostics, including cell enrichment, rapid and selective cell separation, and blood cell analysis.

After my Ph.D., I joined the Karlsruhe Institute of Technology (KIT) in Germany as a post-doc, where I assumed the role of a project leader within the German Research Foundation (DFG)-funded 3D Matter Made to Order (3DMM2O) excellence research cluster. My key research contributions from my tenure at KIT include using electrospinning for hierarchical structures, transforming it into a 3D printing tool, developing laser-written graphene-based flexible biodevices, and 3D printing carbon microlattices for tissue engineering scaffolds. Additionally, I delved into the emerging field of engineered living materials (ELMs), pioneering engineered living carbon, creating a taxonomy for ELMs, and gathering for the first time the ethical issues of ELMs. Apart from driving scientific projects, my responsibilities also included thesis supervision (1 PhD, 6 M.Sc., and 1 B.Sc. theses), project management, and establishing national and international collaborations.

During my research career, I sought scientific leadership and independence through cultivating research ideas, leading to national and international research proposals. Notably, in 2023, I successfully secured a DFG-funded project on ELMs (Cera-LiFE). In the same year, I was awarded the prestigious Marie Sklodowska-Curie Actions Fellowship (Grant: 101106022) by the European Commission, which currently guides my exploration of 3D printed functional carbon materials for novel tissue engineering scaffolds at the IMDEA Materials Institute, Spain. The total amount of research funding I secured to date is €317427.

To date, my research activities have produced 66 publications (62 articles and 4 book chapters; Total citations: 823; h-index: 17), 25 conference presentations (3 invited talks), and 1 US patent (US10821654B2). Establishing strong international collaborations, I have worked with research groups from diverse countries, such as the USA, India, Germany, Spain, Mexico, Turkey, and Denmark, resulting in 28 publications and the organization of two international conferences.

Through the Ramon y Cajal fellowship, I aspire to engage in a new research trajectory on novel living machines at the Universidad Politécnica de Madrid, through innovating novel processing technologies for high-performance materials and seamless integration of these materials with living cells.

**Resumen del Currículum Vitae:**

PUBLICATIONS: 66 (Journal article 62, Book chapters: 4; Open access publications: 24; First author journal publications: 21; Corresponding author journal publications: 18); Total citations: 823; h-index: 17

INTERNATIONAL CONFERENCES: 25 (Oral presentations: 18, including 3 invited talks; Poster presentations: 7)

RESEARCH PROJECTS:
Successful research projects as PI: 3 (including 1 DFG project and 1 Marie Sklodowska-Curie Actions Postdoctoral Fellowship); Total amount of research funding secured: €317427; Number of proposals submitted as PI: 9 (including DFG, MSCA, EIC Pathfinder challenge, ERC Synergy); Number of successful proposals involved as PI or researcher: 4

TEACHING EXPERIENCE:
Role: Teaching Assistant, Clemson University, USA; Course: Fundamentals of Micro/Nanofabrication; Manufacturing Processes; Job description: Course structure preparation, Grading, Practical sessions, Teaching a few topics on microfabrication; Period: 2017 – 2018

MENTORSHIP EXPERIENCE:
- Supervisor, Karlsruhe Institute of Technology, Germany; 1 ongoing Ph.D. thesis; 6 M.Sc. and 1 B.Sc. theses; 1 M.Sc. and 3 B.Sc. internships; Period: 2019 - 2023
- Mentor of Undergraduate Researchers, Clemson University, Clemson, USA; 14 undergraduate students working on 6 projects; Period: 2015 - 2018

CONFERENCE ORGANIZATION:
- Organizer of the symposium on "Smart and Living Materials for Advanced Engineering Systems" approved for MRS Fall 2024
- Co-chair of Carbon-MEMS 2022 meeting in Copenhagen, Denmark. 2022
- Organizer of Carbon-MEMS 2021 virtual meeting, 2021

REVIEWER AND EDITOR:
- Proposal Reviewer, the New Direction Grant, American Chemical Society, 2023
- Proposal Reviewer, 2023 Regular FONDECYT National Projects Competition, The Government of Chile, 2022
- Guest Editor, Methods collection: Design and Manufacturing Methods and Applications for Smart and Living Materials, in Journal of Visualized Experiments (JoVE), 2023
- Guest Editor, Special Issue: The Early Career Collection: Nanofabrication, in Frontiers in Nanotechnology, 2022
- Guest Editor, Special Issue: C-MEMS: Microstructure, Shapes, and Applications in Carbon, in Micromachines, MDPI, 2022
- Guest Editor, Special Issue: Materials, Interfaces and Microstructural Evolution for Energy Applications: Experimental and Computational Advances, in Materials Science for Energy Technology, Elsevier, 2021
- Reviewer of leading journals: Nature Communication, Advanced Functional Materials, Carbon, Matter, ACS Applied Materials and Interfaces, Advanced Science, ACS Biomaterials Science and Engineering, Biosensors and Bioelectronics, Materials Chemistry and Physics, ACS Applied Nanomaterials, Materials Today Energy, etc.

HONORS AND AWARDS:
- Marie Sklodowska Curie Fellowship, Horizon Europe (Grant: 101106022), 2023
- MRS Travel Award, the best oral presentation, MRS Spring meeting, 2023
- MNE 2021 Micrograph People's Choice Award, Micro and Nano Engineering Conference, 2021
- Eastman Chemical Award, Mechanical Engineering Department, Clemson University, USA, 2018
- Doctoral Scholastic Achievement Award, Mechanical Engineering Department of Clemson University, USA, 2017
- Hitachi High Technologies Electron Microscopy Fellowship, Hitachi High Technologies, Clemson University, 2016
- Professor A K Seal Memorial Undergrad Research Award, Global Alumni Association of Bengal Engineering and Science University, 2012

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | MARQUEZ ALCAIDE, ABRAHAM |
| **Referencia:** | RYC2023-044803-I |
| **Correo Electrónico:** | amarquez9@us.es |
| **Título:** | Optimal Power Converter Operation with Enhanced Lifetime Management |

**Resumen de la Memoria:**

His main research line can be defined as "Optimal Power Converter Operation with Enhanced Lifetime Management." More than 60% of failures present in a power converter are related with the aging of the power devices and capacitors. Power devices are degrading because of the unavoidable thermal cycles present in the junction provoking silicon breaking and/or bonding lift-off. Capacitor's aging is related with the operating voltage and its hot-spot temperature which depends on power loss. Due to sudden previous faults, manufacturing tolerances, physical location and parasitic capacitances and inductances, the aging of the power components is not equalized in a power converter. This fact is crucial because the reliability of the converter depends on the weakest component. Academy and industry have developed specific techniques (Active Thermal Control (ATC)) dealing with this unequal ageing. However, these techniques present negative effects. Dr. Marquez has developed several advanced modulation and control strategies for power converters to remove or mitigate the ATC negative effects. This is critical because these contributions permit to apply ATC leading to extend the overall power converter lifespan without degrading the converter performance.

Dr. Marquez's works re-formulate the ATC optimization minimizing a multivariable cost function. Different terms such as the harmonic spectrum of the current flowing through the common capacitor, the grid currents quality, the common-mode voltage or any other targets can be considered. Dr. Marquez approaches consider the using the Fourier Expansion Series approach, or the Fourier Integral including variable carrier phase-displacement angles that are determined to optimize the converter performance. As a result, the modulation techniques have a great impact over the RUL of the components without requiring extra hardware and filtering, which makes this solution very attractive for the adoption in industrial applications.

In addition, Dr. Marquez has developed a novel numerical method to estimate the evolution of the most important electro-thermal magnitudes within the power converters much faster than conventional simulation environments shown a good accuracy. This becomes especially relevant for the prognosis and the smart maintenance paradigm since these techniques enable the use of digital twins and the training of the advanced recurrent neural networks for the calculation of the damaged provoked.

**Resumen del Currículum Vitae:**

Dr. Abraham M. Alcaide presents a vast track record even though his short post-doctoral trajectory, including 3 books and 57 papers in high quality international journals, 40 ranked in Q1, 38 among the first three authors and corresponding author in 20 of them. The applicant is ranked in the "World's Top 2% Scientists" list as part of the most influence researchers on the world and are currently 4 papers are also tagged by the prestigious Highly Cited Researcher List by Clarivate as Highly Cited Papers, that is, they are cited more than 99% of the papers of the same publication year. He has a H22 index with more 3200 citations according to his google scholar profile.

He is an active member of the international academia. He co-organized the 2023 edition of the "Seminario Anual de Automática y Electrónica Industrial (SAAEI' 23)" held in Sevilla and it is part of the organization staff for the next edition in addition to 4 tutorials, 6 special session and 42 conference papers.

He has carried out 5 research stays in high-level institutions and research groups accumulating 15 months in total. Two of them (3 months each) have been carried out in the Harbin Institute of Technology (China) which is ranked in the 26th in the engineering field according to the rank of Shanghai. The rest has been carried out in the Advance Centre of Electrical Electronic Engineering (AC3E) of the Universidad Técnica Federico Santa María (UTFSM) which is the most important research centre in Latin America. It is important to remark that a 5 Months stay in AC3E was funded by the "José Castillejo 2022 para jóvenes doctores" grant.

He has participated in 22 research projects with public and private funds. In 5 of them, Dr. Marquez is co-IP managing a total budget of 300k€ The Universidad de Sevilla is co-owner of one European patent where he is the main author.

As recognition of his work, he has received three times the best paper award of the Industrial Electronics Magazine (IEM) (years 2014, 2021 and 2023), a journal of the IEEE Industrial Electronics Society. Additionally, in his PhD stage he was awarded with the student travel grant of the IES. This award allowed to travel to the IECON 2014 (held in Japan) conference to present his research work.

Dr. Marquez has been the supervisor of 5 Master students and 9 Bachelor students, one visiting PhD and one Erasmus+ student. Currently he is co-supervising 1 PhD student, 5 Master students and 8 Bachelor students

**Resumen de la Memoria:**

Javier Senent Aparicio holds a Ph.D. in Civil Engineering from the University of Murcia (2012) and is currently working as a Postdoctoral Researcher at UCAM. He has developed the whole of his professional and research career in subjects related to hydrology and water resources planning and management. Before defending his doctoral thesis, he specialized through master's degrees at national and international universities. During his predoctoral stage, he combined his work as a consulting engineer with the development of his doctoral thesis. Only since 2012, he has been dedicated full-time to his scientific career when he started teaching at UCAM. He has been the first academic with a Ph.D. in the Department of Civil Engineering at UCAM, so he has had to gradually build his research team by leading doctoral theses. In recent years, his research career is influenced by the achievement of 6 major successes that have allowed him to develop his own research lines, collaborating with renowned international researchers through research stays funded by highly competitive calls (1.- Fulbright fellowship; 2.- Jiménez de la Espada fellowship; 3.- José Castillejo fellowship) and conducting as principal investigator research projects also funded by highly competitive calls (4.- WaterOT project – Retos-Colaboración call; 5.- SMARTLAGOON project – Future and Emerging Technologies H2020 call; 6.- TwinTagus project – Proyectos de Generación de Conocimiento call).

His research focuses on bridging the gaps between hydrological models and real-world implications by developing novel applications that overcome current scientific limitations to offer valid solutions to real problems, including: (1) innovative applications that combine empirical models, such as machine learning techniques, with physically based hydrological models, such as the SWAT model; (2) uncertainty analysis in model inputs and outputs; and (3) scenario analysis, expressing for example the possible effects of changes in land use and climate on the water cycle and exploring interventions to be used by water managers and policy-makers.

**Resumen del Currículum Vitae:**

Javier Senent Aparicio holds a Ph.D. in Civil Engineering from the University of Murcia (2012) and is currently working as a Postdoctoral Researcher at UCAM. He has developed the whole of his professional and research career in subjects related to hydrology and water resources planning and management. During his predoctoral stage, he combined his work as a consulting engineer with the development of his doctoral thesis. He has been the first academic with a Ph.D. in the Department of Civil Engineering at UCAM, so he has had to gradually build his research team by leading doctoral theses. The applicant has supervised 9 doctoral theses. All of them have been unanimously evaluated with Sobresaliente cum laude, seven of them have been defended by a compendium of publications, and one of them is a doctoral thesis with a mention of industrial doctorate.

He has produced a high impact in the field of hydrology, being co-author of a total of 56 papers in JCR-indexed journals, where he is the first author on 18 of them while his doctoral students are first authors on 32 of the articles, demonstrating his leadership skills and independence (only 1 paper is published with his thesis advisor). His research has attracted more than 1300 citations (over 400 only in the last year), with an h-index of 22 in Scholar and 19 in Scopus. He has also presented around 60 communications at national and international congresses.

As a postdoctoral researcher, he has obtained highly competitive grants breaking down several scientific barriers at UCAM. It should be noted that the applicant was selected by the Fulbright Commission to carry out a research stay at Texas A&M University (USA) at the beginning of 2019, being the first UCAM professor to be awarded a Fulbright grant. He has also been awarded a Jiménez de la Espada scholarship funded by the Seneca Foundation for a research stay at the University of Aarhus (Denmark) during 2020. Recently, he has also been awarded a José Castillejo scholarship funded by the Spanish Ministry of Education for a research stay at the Kings College London (United Kingdom) during 2022. In total, including the predoctoral stage, he has more than 26 months of international research experience. Javier Senent-Aparicio is the scientific project coordinator of the SMARTLAGOON project funded in an H2020 Research and Innovation Action with a total budget of around 4 million euros, being the first UCAM professor to coordinate an H2020 project. At national level, he is also the principal investigator of the TwinTagus project funded by a "Proyectos de Generación de Conocimiento 2021" call with a budget of over 80.000 euros. In addition, he has carried out numerous technological development and innovation activities, collaborating with both the public and private sectors, as evidenced by the fact that he was principal investigator of the recently completed WaterOT project funded by a Retos-Colaboración Call with a budget of more than 1.1 million euros. All these merits have made it possible for him to be recently awarded (November 2023) the R3 certificate as an established researcher with a score of 93.5 out of 100.

He also has an extensive teaching experience of over 1900 hours in hydrology, water resources planning and management, and hydrological modeling at bachelor, master, and Ph.D. levels, supervising 45 BSc theses and 11 MSc theses.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | LORITE DÍEZ, MANUEL |
| **Referencia:** | RYC2023-044496-I |
| **Correo Electrónico:** | manuloritediez@gmail.com |
| **Título:** | Estelas tridimensionales tras cuerpos romos |

**Resumen de la Memoria:**

My research work is focused on the study of wakes behind bluff bodies. During my career, I have considered mostly fundamental perspectives, exploring simplified configurations, motivated by applied real problems such as the development of efficient aerodynamic improvement systems in heavy road transportation. To develop my research activity, I have employed a diverse set of complementary approaches in Fluid Mechanics. These include engaging in modeling, conducting stability analysis, performing numerical simulations, and, notably, undertaking cutting-edge experiments. The most relevant results are included in 12 manuscripts already published, and two additional ones currently accepted with minor changes (8 of them without the supervision of my PhD advisors), where my contribution is evident from the authorship order. All my publications can be openly downloaded from gold/green open access formats. In these works, I have consistently pursued research excellence by publishing my work in leading journals in my field (9 JCR Q1, 5 JCR Q2) with high impact (138 citations, h-index: 7 in Google Scholar). These contributions are based on strong international collaborations with world-leading research groups in my field from top Institutions as Toulouse Institute of Fluid Mechanics (France), ENSTA Paris - Institute Polytechnique de Paris (France), University of Liverpool (UK), ESPCI-Paris (France) and ISAE-SUPAERO (France). Their substantial added value has helped me to become an emergent experimentalist in an international environment with a wide and rich experience in hydrodynamics/aerodynamics facilities (wind tunnels, towing tanks and flumes) and in many measurement techniques of very different nature: laser velocimetry (especially important is my pioneering expertise in the revolutionary technique 3D-PTV 'Shake-the-Box'), pressure measurements, aerodynamic/hydrodynamic characterization, off-design conditions and multiphysics environments (moving bodies, bubbles, flexible materials). As a result, I am a frequent reviewer (12 revised manuscripts in 2023) of the most important journals in Fluid Mechanics. In terms of dissemination, I have participated in my more than 25 international conferences mainly through oral presentations and have delivered several invited seminars at prominent institutions as Imperial College or ESPCI-Paris. I have given outreach talks in Colegio de España in Paris (2018), European Researchers' Night, Science Weeks and PIIISA projects.

The proposed research line investigates the 3D coupling between moving bodies or self-adaptive passive devices interacting with a wake flow to extend our knowledge on efficient transportation systems (Main goal). This research line represents an implicitly new approach based on new experimental techniques related to fully 3D and time-resolved fluid-structure interaction diagnostics. It aims the integration of different state-of-the-art techniques as 3D-PTV 'Shake-The-Box' algorithms, CAD models integration, TOMO reconstruction and sizing for moving bodies and DIC (Digital Image Correlation) for deformations of flexible devices. Most of these cutting-edge techniques are still under development internationally and represent a new paradigm for studying Fluid-Structure-Interaction or Fluid Mechanics problems.

**Resumen del Currículum Vitae:**

I carried out my PhD thesis in the Fluid Mechanics and Fluid-Structure-Interaction research group at the University of Jaén (UJA) thanks to obtaining a FPU contract (1st in the INA sub-area) between 2015 and 2019. During my PhD, I spent 9 months at ENSTA-Paris (France) in two separate stages, funded through competitive calls, starting a fruitful collaboration with researchers from ENSTA-Paris (EP) and the University of Liverpool (UL). After obtaining the international doctorate with 'cum laude' distinction, Toulouse Fluid Mechanics Institute (IMFT, France), a European leader in Fluid Mechanics, hired me as a postdoctoral researcher. I participated for 15 months in various interdisciplinary experiments that shared the use of the state-of-the-art laser velocimetry technique for characterizing fluid flows in 4 dimensions 3D-PTV 'Shake-the-Box', in which I have a pioneering expertise. In that way, I collaborated with researchers from the ASI and FEP research groups from IMFT. In 2021, I spent 11 months at the University of Malaga (UMA) thanks to a competitive 3-year postdoctoral PAIDI 2020 contract (1st in the TEP area). During this period, I led experimental tasks related to existing research projects in the Malaga Fluid Mechanics group. In January 2022, I joined the University of Granada as a JdC 2020 Postdoctoral Researcher (1st in the INA sub-area). Since my incorporation, we have obtained 2 National Research projects related to this line (more than 360k€). In fact, I am the only PI of the PID2022-140433NA-I00 project that obtained all the requested budget (92/100 mark), being the youngest researcher in UGR to lead a project of this type (2% youngest in PIN area).

My background has allowed me to publish 12 articles, in addition to two other accepted ones with minor comments (8 of them without the supervision of my PhD advisors), in leading journals in the field of Fluid Mechanics and disseminate my research at more than 25 international conferences, generating about 138 citations (h-index: 7). These contributions have granted me a relevant role as an emergent experimentalist in my field, making a substantial impact on the scientific community as the keynote talk in ERCOFTAC SIG47 Workshop or my reviewer record in leading journals reflect. My career is based on strong international collaborations with world-leading research groups in my field. As an example, I played a key role in the organization of the 2023 MSCA-Doctoral Network NITRAT consortium which involves 10 top research institutions and 3 leading industrial partners (+3M€). My research experience has been funded through competitive research projects, with participation in 10 of them. Additionally, I have obtained over 300k€ in individual competitive calls at all stages of my career. In terms of knowledge exchange and innovation, I have participated in 5 industrial contracts (over 600k€) and I am a co-inventor of 3 international patents (1 exploited by Liderkit). Furthermore, I have delivered more than 400 hours of university teaching at undergraduate and master's levels in various institutions (UJA, EP, UMA, and UGR), including practical and theoretical lessons. Furthermore, I have co-supervised 5 undergraduate theses, 3 master's theses, and currently co-supervise 2 PhD theses related to my research line. Finally, I hold the Acreditación Contratado Doctor (PCD) by ANECA.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | ERGENC -, DUYGU |
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| **Correo Electrónico:** | ergencduygu@gmail.com |
| **Título:** | Architectural heritage conservation science |

**Resumen de la Memoria:**

Several of my courses in geological engineering directly prepared me for investigating geomaterials. After my internship at the archaeological site, I decided to continue my graduate studies in the Restoration program, where every course required extensive research and writing on cultural heritage. In one semester, courses were designed to prepare a conservation project in which I had to conduct fieldwork in ruined hammam dating to 12th century, experiments, and research to prepare a conservation strategy case. This gave me the real-world experience I needed to know how to complete research specific to each case I work on. My master thesis investigated stone quarries used for foundation stones of a Hellenistic temple. My PhD research focused on the similarities and differences between Roman mortars found in the two ends of the Mediterranean basin. Additionally, I explored how new mortars can be made more effective and compatible with historical materials. In parallel, I worked on Roman mortars in the Mediterranean Basin with the research protocol I established in my PhD. Design of new binding material is critical because mortar/ plaster is first to be deteriorated, replaced during renovation, used in anastylosis or conservation in archaeological sites, moisture and water flow in the masonry are directly affected by new mortar/plaster therefore wrong intervention can make the present deterioration worse. I fabricated repair mortars with the empirical knowledge that I gathered from Roman mortars, using lime, original Roman ceramic fragments as aggregates and additives, a method practiced by archaeologists. To overcome the slow setting drawback of lime, I explored how to accelerate lime carbonation. In an aerial composite material, such as lime, as the carbonation progresses the pores close and the mechanical strength and water resistance increase. I continued to work on increasing mechanical and physical performance of the mortars by improving their chemical reactions with nanomaterials. I also focused on adding other functionalities to lime mortars. I enhanced lime mortars with nanomaterials to improve their properties and add new functionalities. I conducted research on removing salt from stone by using mortar that has specific mineral additives. I researched sustainable solutions for cultural heritage conservation, focusing on reducing salt in Roman brick masonry walls with biobased and waste additives added to the plaster. I've researched 12 archaeological sites in 7 countries, studying historic building materials and developing new ones for conservation and restoration.

My primary research objectives revolve around climate change adaptation and sustainability in conservation. Rapid climate changes can speed up the process of material degradation and loss. Multidimensional conservation is a strategy that can enhance the resilience of cultural assets to disasters and climate change. To implement ecological interventions with minimal impact, innovation is crucial. This can be achieved through the use of smart resource management, eco-friendly materials, and compatibility with historical materials.

**Resumen del Currículum Vitae:**

I majored in geological engineering at METU, in Turkey, had MSC degree from Restoration Graduate Program at METU. Meanwhile, working as a research assistant in the Materials Conservation Laboratory allowed me to participate in various interdisciplinary national and international projects, perform fieldwork in renowned heritage places and learn how to conduct experiments and use analytical techniques, apart from receiving funding.

I hold my PhD from ETSAM-UPM. During and after my PhD, I worked for six years at the Institute of Geosciences (IGEO (CSIC/UCM)) as a researcher in a multi-institutional and national - international co-operation. I obtained Seal of Excellence from highly competitive Marie Sklodowska-Curie Individual Fellowship and then I was awarded a Marie Curie COFUND Grant. I moved to Turkey for my MSCA project based at the Department of Civil Engineering at METU.

Apart from institutions in Turkey and Spain, I worked for six months in LNEC and University of Évora in Portugal, and three months in various departments at KU Leuven, Belgium. Taking an interdisciplinary approach to heritage conservation science, I have strong communication and adaptability skills, which are useful for my work with multidisciplinary and multinational groups. My international and interdisciplinary work experience, full of mobility, allowed me to meet people with diverse perspectives on heritage conservation, enriching my vision. I pioneered new cooperation without severing my ties with any of them.

I have published 33 peer-reviewed articles in high-impact international journals and books in the scientific fields of engineering, construction, material science, architecture, and archaeology, and I am the first author of 19 of them. After my PhD, I published nineteen articles.

I am competent in analytical techniques such as stereomicroscope, polarized optical microscopy, scanning electron microscopy, X-Ray diffraction, thermogravimetric analysis, mercury intrusion porosimetry, mechanical and physical testing, wet chemical analysis, non-destructive testing, among others.

I have presented the results of my research mostly in English but also in Spanish and Turkish. I participated in the organization of an international conference and workshops; I organized an international workshop. I have been involved in writing five multinational grant applications and project development. I have three ongoing projects now, one of which I am the PI.

I am a member of ICOMOS Turkey and the International Scientific Committee of Stone and Climate Actions Working Group.

Transferring what I know to my students of architecture, urbanism, engineering, and science from different nationalities and seeing their progress gives me great fulfilment and encourages me to do more research with them. For 4 years, I have instructed two courses, Diagnosis and Treatment of Material Decay in Historic Structures and Laboratory Experiments in Conservation Science in the Graduate Program of Conservation of Cultural Heritage at METU, where the teaching medium is English. Each of these involves three 50-minute-long lectures per week, for which I developed the curriculum. I also held office hours, conducted fieldwork.

**Resumen de la Memoria:**

Early in my scientific career I came across the crude reality of that only a fraction of the potential of Nuclear Magnetic Resonance (NMR) translates into tangible benefits for patients, primarily due to the prohibitive costs of this technology. This realisation inspired me to spend my PhD and postdoctoral efforts developing purpose built low-cost MRI devices. This pursuit has made me follow a scientific career in groups deeply committed to bridge the gap between scientific developments and being able to provide these to patients. Although it is an essential to render the scientific effort truly impactful, this recognized gap exists because going the extra mile requires a skilful, long and uncertain effort for the industry and, at the same time, it is an effort vaguely incentivized in the scientific community as current scientific impact metrics fail to credit it. I am confident that my scientific effort has built several bridges.

Unlike most NMR researchers who are specialised on few aspects of this multifaceted modality, I have developed a rather unique profile compiling expertise on many aspects of biomedical engineering and physics, which covers all the phases from envisioning original solutions to developing them from the most basic physical principles to a functional device that helps patients in real scenarios. This has been the result of having walked a less conventional path with renown research groups that collaborates shoulder-to-shoulder with top-flight companies and hospitals. The success of my research is confirmed by 3 innovative instruments that stem from my work, 2 of which have attracted the interest of leading companies (General Electric, Agilent Technologies, IntelliDesign) and the other one is the pillar of a flourishing Startup (PhysioMRI), in which I led the development and construction of its prototype. Two of these developments are already helping patients to double their capability to fight cancer and democratising the early detection of musculoskeletal diseases.

Not surprisingly, my host institution is the Quantum Nanophotonics Laboratory (QNL) at the MPC. Led by Prof. Gabriel Molina-Terriza, this lab has pioneered the research in quantum sensing and communications in the Basque Country. It is equipped with state-of-the-art instrumentation to which I have contributed building the first and only diamond-defects-based quantum instrument of the Basque Country. This contains custom made high-end components like a versatile quadrature microwave antenna and is ready to serve as a test-bench key for this proposal. This investment in instrumentation plus currently opened positions corroborate the commitment of MPC for this research line, which is defined as strategic in MPC's 2022-2025 action plan. Importantly, the MPC also hosts key collaborators for my research such as top-flight experts in polymers nanofabrication which will functionalise the surface of diamonds to convert these in ultra selective and sensitive detectors towards analytical Lab-on-a-Chip solutions.

**Resumen del Currículum Vitae:**

My scientific career has been devoted to the development of methods and instrumentation for medical applications. My career aim is to advance biomedical instrumentation while making it more affordable to improve its impact in society and reduce current unequal access to healthcare. My experience in industry provided me with important management skills and a drive to create pragmatic devices. Throughout my career in world-class international research centres (ETHz-Switzerland, Erasmus MC-The Netherlands, University of Queensland- Australia, PTB&Charité- Germany) and collaborating shoulder to shoulder with world leading companies in high end instrumentation (GE&IntelliDesign) I have developed a unique profile compiling expertise on most of facets of NMR such as clinical applications, hardware engineering, physics and signal post-processing. I have developed 3 medical devices, two of which are being used to double the effectiveness of cancer treatment and facilitating the detection of musculoeskeletal pathologies.

Besides developing original and high-performance advanced instrumentation, I also attracted as PI a FET-Open grant from the ERC. With the workforce of a postdoc, a PhD student, a mechanical engineer and a masters student, I have led the startup PhyioMRI, developing its flagship MRI prototype from scratch to such level of technological readiness that is in the process of being certified as medical instrument, and has received Valencian Community's best Spin-off prize.

I have followed a less conventional trajectory in institutions with strong technology transfer tradition, where developing practical instruments with their corresponding know-how and patents has had priority over scientific publications. The outcomes of my PhD and first postdoc work led to the generation of 3 patents, which have been leased to Intellidesing and attracted a $1 million BioMedTech grant. Owing to my leadership skills and my insight in the project I become a consultant for this international project being part of its leadership at the steering committee and mentoring the technological developments.

I received a prestigious Marie Curie fellowship to start a new research line developing novel quantum enhanced NMR devices at the Quantum Nanophotonics Lab at MPC. This considerable career jump has offered me the opportunity to build additional skills in optics and the quantum realm of physics. With the invaluable mentoring of the group leader, Prof. Gabriel Molina-Terriza, we have attracted generous funding to provide a new dimension to the optics lab complementing it with a whole range of commercial and home built advanced instrumentation electronics. After two years of establishing the lab we have posibly the most advanced lab for NV centers instrumentation of Spain, which is ready to start bearing fruits. I currently led this research line composed of another postdoctoral and a doctoral colleagues.

In parallel to my research activities, I have been dedicated to knowledge sharing via promoting open source practices (core member of the Open Source Imaging Initiative), supervising (14 masters', bachelor and internship projects), being part of the evaluation committee of a PhD student, and teaching (coordinator of a Masters' course at The University of Queensland, achieving the recognition as Associate Fellow by the Higher Education Academy).

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | ORTEGA HERAS, JAVIER |
| **Referencia:** | RYC2023-044886-I |
| **Correo Electrónico:** | johe00@gmail.com |
| **Título:** | Improving structural diagnosis of Architectural Heritage with non-destructive testing and structural analysis |

**Resumen de la Memoria:**

My research career has focused since my early steps in better understanding historic structures, given my interest in the conservation of the built heritage. After graduating as an architect from the Polytechnic University of Madrid, in Spain, I pursued deeper knowledge in structural engineering with the MSc in Advanced Masters in Structural Analysis of Monuments and Historical Constructions (SAHC) granted jointly by the University of Minho (UMinho) and University of Padova. After that, I continued my specialization in the field of structural conservation and forensic engineering and earned my PhD in Civil Engineering from UMinho, where I was also a Post-Doctoral researcher. I have always tried to apply the best practices of the architectural and engineering perspectives in my research, strengthening the ties between both fields of expertise and keeping a holistic approach in mind, as is common in conservation projects. I actually consider that a close collaboration between professionals of both fields is the optimum way of approaching research in historic structures.

Currently, I am a ComFuturo Fellow at ITEFI (CSIC), working on developing novel methods for the on-site inspection and precise 3D reconstruction of the inner morphology of historical masonry elements using automated non-invasive systems and Deep Learning algorithms. Previously, as a MSCA fellow, we designed and built a novel automated sonic tomography system to inspect masonry walls that has been tested in laboratory and on-site in real case studies. My main research interest lies primarily in the field of conservation of the historical and vernacular structures, including most of the phases that are necessary for a conservation project: visual inspection; architectural and structural surveying and documentation; experimental on-site and laboratory campaigns; advanced structural analysis; design and study of repair and reinforcement solutions.

The main research lines that I followed in the recent years and I expect to continue working in the future are: (1) Structural diagnosis involving advanced structural analysis and non-destructive evaluation; (2) Tomographic imaging the interior of historical construction elements; (3) Material and structural characterization of representative heritage structures through laboratory testing; (4) Detailed and large-scale seismic vulnerability assessment of historic constructions; (5) Conservation management of the built heritage and heritage impact assessment.

My main field of expertise is the structural diagnosis of historical constructions using advanced structural analysis (i.e. finite element analysis) and non-destructive testing. Research works within this field have been complemented with professional experience on international consultancy works. My current main line of investigation deals with the development of new technologies (equipment and methods) for NDE of historical structures, based on tomographic inspections and integrating automation and robotics, UAVs and remote sensing, artificial intelligence, and digital technologies. Such systems are expected to provide accurate information about the interior of existing heritage structural elements (e.g., inner morphology or damage), which is extremely valuable for structural diagnosis and analysis, focusing on methods that are useful for professionals in the field.

**Resumen del Currículum Vitae:**

I am currently a ComFuturo fellow, aiming to develop novel methods for the on-site inspection and precise 3D reconstruction of the inner morphology of historical masonry elements using automated non-invasive systems based on acoustic wave propagation techniques and Artificial Intelligence. Previously, I was awarded the MSCA-IF to develop novel non-destructive inspection tools for the mechanical characterization of historical masonry.

I am co-founder and associate of FENEC, a non-profit association providing non-destructive testing and specialized structural analysis services for the built heritage. We have participated in several seismic retrofitting projects, including the World Heritage Site (WHS) of Gjirokastra (Albania), the Heraklion Venetian shipyards (Greece) and the castles of Agia Roumeli and Loutro, in Crete (Greece). We have also funded research in the field of heritage conservation and collaborated with universities, such as the EPFL and the University of Zagreb. I am also member of ICOMOS, for which I carry out heritage impact assessment reports for WHS since 2019.

My research career has primarily focused on obtaining a better understanding of historical and vernacular structures. My research work has been enriched with consultancy projects, numerous field missions, and professional experience. I have over ten years of professional and academic experience in the field of conservation of historical and vernacular structures, working on many monuments throughout the world. During my research career at the UM, I had the opportunity to participate in consultancy projects and survey and analyze important monuments, including several World Heritage Sites, such as the Shah Mosque in Isfahan (Iran) or the Alhambra in Granada (Spain). In the non-academic sector, I have international experience as a consulting engineer specialized in Non-Destructive Testing (NDT) in the USA, in Atkinson-Noland & Associates, where I worked in emblematic buildings, such as the Brooklyn Bridge and Yale University. As an independent professional, I have collaborated in conservation projects such as the structural retrofitting of the Tomb of Symvola, in Komotini (Greece). I believe this complementary expertise involving academic and professional works is essential to carry out sound research in the field of conservation of historic structures, since it allows understanding the decision-making process and identifying the needs for research.

In summary, I have participated in twelve research projects in the field of conservation of heritage structures, being principal investigator (PI) of five of them, raising a total of 1.17 M€as PI since the completion of my PhD (HWITHIN, INHAVIT, DocumeNDT, S-RAY and MeDeAH). I have supervised 10 Master's Thesis and 1 Ph.D. Thesis. I am co-supervising 5 Ph.D and I have secure funding for another pre-doctoral contract within the national research project MeDeAH. I have taught in the Advanced Masters in Structural Analysis of Monuments and Historical Constructions (SAHC), at the University of Minho and at the Escola Superior de Gallaecia (ESG). My h-index (Google Scholar) is 12 (502 citations), with 22 publications indexed in JCR and Scopus FWCI of 1.86. I have reviewed more than 50 papers in 22 different scientific journals. I was in the reserve list of last RyC2021 and RyC2022 calls.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | MITSUUCHI  TASHIMA, MAURO |
| **Referencia:** | RYC2023-045079-I |
| **Correo Electrónico:** | maumitta@hotmail.com |
| **Título:** | M.M. Tashima: Desarrollo y caracterización de nuevos sistemas cementantes |

**Resumen de la Memoria:**

Fue pionero en desarrollar estudios sobre materiales puzolánicos en la UNESP (bajo supervisión del prof. Akasaki) mientras era estudiante de grado y becario de investigación (convocatoria competitiva) durante 3 años (2002 a 2004). Fue el primer estudiante de maestría en la UNESP en realizar una estancia en el extranjero, específicamente durante 8 meses en la UPV-España, bajo la supervisión del prof. Payá. Además, supuso el inicio de la movilidad, internacionalización e independencia del investigador. Durante su doctorado, desarrolló un método sencillo e innovador para evaluar la reactividad de materiales puzolánicos utilizando medidas de pH y conductividad eléctrica de suspensiones cal:puzolana. Es el responsable de la producción del primer conglomerante activado alcalinamente (CAA) en el grupo GIQUIMA-UPV liderado por el prof. Payá, lo que ha contribuido significativamente a la visibilidad y el aumento del número de publicaciones del grupo. Al regresar a Brasil y establecerse como profesor en la UNESP, creó la línea de CAA dentro de MAC. Su gran capacidad de liderazgo, independencia y el elevado conocimiento científico consolidaron a MAC como referencia nacional en la caracterización de residuos para aplicaciones en la Ing. Civil. Durante su estancia posdoctoral en la Universidad de Alicante (ayuda FAPESP), logró producir CAA multifuncionales, ampliando las posibilidades más allá de las matrices a base de cemento Portland, que es la especialidad del grupo del prof. Garcés. En su estancia actual en la UPV (ayuda María Zambrano), está introduciendo la aplicabilidad de conglomerantes sostenibles en la producción de tejas con reducido impacto ambiental, pavimentos permeables para un desarrollo sostenible y en la mejora de las propiedades mecánicas e hidráulicas de los suelos, ya que posee adecuada formación y conocimientos en ingeniería civil.

Teniendo en cuenta la necesidad de la sociedad actual, los avances existentes en la construcción civil y la preocupación con el medio ambiente, este proyecto se propone estudiar y optimizar el efecto del grafeno y sus derivados en hormigones y morteros producidos con cementos con bajas emisiones de $CO_2$. Se pretende analizar e interpretar como la adición de estos nanomateriales pueden modificar los procesos de hidratación de los cementos con bajos contenidos en clinker, y por tanto las consecuencias que dicha adición puede provocar sobre las propiedades mecánicas y de durabilidad. Además, desde el punto de vista más aplicado, la idea es desarrollar este tipo de sistemas en la producción de piezas prefabricadas o, también, estudiar la influencia del grafeno en la difusión de calor en pisos radiantes a base de cementos con bajas emisiones de $CO_2$. Es relevante destacar que, hasta la fecha, no se ha encontrado ningún estudio sobre este tema en la literatura existente con este tipo de cementos. La metodología que sería aplicada para el desarrollo del proyecto consistirá en 5 etapas principales:
1. Búsqueda bibliográfica.
2. Caracterización de los materiales, en especial del grafeno y sus derivados.
3. Estudio de la influencia del grafeno y sus derivados en la hidratación de los cementos con bajas emisiones de $CO_2$.
4. Efecto del grafeno y sus derivados en la durabilidad de los cementos con bajas emisiones de $CO_2$.
5. Aplicación de sistemas seleccionados en piezas prefabricadas y en pisos radiantes.

**Resumen del Currículum Vitae:**

Mauro M. Tashima es brasileño de 41 años, ingeniero civil (UNESP 2000-2005) con una sólida formación académica, que incluye maestría (UNESP 2005-2006) y doctorado (UPV 2007-2012). Durante su periodo posdoctoral, estuvo gran parte del tiempo contratado como profesor titular por la UNESP (11/11/2013 a 01/10/2021) donde impartió clases para el grado en Ing. Civil (carga horaria total de 1000h), maestría en Ing. Civil (2250h) y doctorado en Ciencia de los Materiales (300h). Además, recibió becas destacadas, como las ayudas FAPESP para desarrollo de investigación en el exterior (1 año, 2018-2019) y la María Zambrano en España, financiada por la Unión Europea NextGeneration EU (3 años, 2021-2024). Ha destacado liderando 6 proyectos de convocatorias competitivas y 3 de convocatorias internas, además de participar en proyectos nacionales y de cooperación internacional (12). También ha establecido colaboraciones nacionales e internacionales (Friedrich-Alexander University Earlangen-Nuremberg, Universidade de Aveiro, USP - campus de Pirassununga y Universidade Federal do Rio de Janeiro). Ha dirigido tesis doctorales (2) y de maestría (13), así como supervisado a estudiantes de grado financiados en convocatorias competitivas (16). Sus logros se reflejan en numerosas publicaciones, incluyendo congresos (70), capítulos de libros (7) y revistas científicas (84). Destacar la calidad de su trabajo, con un alto porcentaje de publicaciones en revistas indexadas, especialmente en las de mayor impacto (categorías Q1 y Q2) alcanzando un 86,4%. Además, es autor de correspondencia o primer autor en el 42,8% del total. Su impacto se evidencia en sus índices h (33 y 23) y el número significativo de citaciones (2976 y 1565) en Google Scholar y Web of Science, respectivamente. Actualmente desempeña un papel destacado como líder del grupo de investigación en Materiales Alternativos de Construcción de la UNESP (MAC), es miembro del cuerpo editorial de la revista Buildings y editor revisor de la revista Frontiers in Chemistry. Además, dirige tesis de maestría (1) y doctorales (4), así como un trabajo fin de máster (1). Su trayectoria demuestra además de su independencia y liderazgo, una fuerte capacidad colaborativa, de movilidad y de internacionalización en el ámbito de la investigación.

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| **Área Temática:** | Producción industrial, ingeniería civil e ingenierías para la sociedad |
| **Nombre:** | GIMENEZ BASILE, JUAN MARCELO |
| **Referencia:** | RYC2023-044023-I |
| **Correo Electrónico:** | jmgimenez@cimne.upc.edu |
| **Título:** | A vademecum-based approach for the computational study of multiscale fluid flows |

**Resumen de la Memoria:**

Dr. Gimenez is a recognized researcher in the field of computational fluid dynamics. He has conducted groundbreaking research on developing innovative numerical methods to overcome deficiencies in current simulation technology, with a focus on particle-based and multiscale methods for turbulent multiphase flows and urban airflow simulation. He has a strong background in technologies such as the development of innovative software platforms, high-performance computing, data-driven and machine learning techniques, and co-simulation technologies for fluid-structure interaction. He also has extensive experience in designing numerical methods and addressing implementation issues through various research and technological projects.

His current research line argues that the lack of a reliable description of the dynamic behavior of fluid flows at small scales is responsible for the lack of accurate computational tools for their high-fidelity study. In this context, he is leading the development of an innovative paradigm for the computational study of multiphase and turbulent flows. The multiscale methodology combines particle-based computational methods, machine learning tools, and high-performance computing to construct a data-driven computational vademecum that synthesizes the dynamic behavior at small scales to feed global-scale studies.

The groundbreaking feature relies on the numerical simulation of multiscale fluid flows via the new P-DNS technique. In P-DNS, the coarse solution is obtained using fast and accurate strategies based on the PFEM-2 formulation developed and implemented by Dr. Gimenez in the early stage of his carrer. The P-DNS approach, which was originally developed to solve homogeneous flows with massive instabilities, has been extended to solve general transport equations and out-of-equilibrium flows. These works had the essential contribution of Dr. Gimenez, who collaborated on the mathematical formulation and led the implementation and validation tests. Given the promising results obtained with the P-DNS method for simple turbulent homogeneous fluid flow problems, Dr. Gimenez is currently leading a new research line on heterogeneous flows. The very recent achievements on particle-laden flows have shown a wide range of applications, such as urban pollution and manufacturing processes. These results were successfully disseminated at international conferences and published in high-impact journals.

His consolidated, independent career allows him to devise groundbreaking research and apply for competitive project funding. Dr. Gimenez has secured funding up to 2025 through his GRAIN proposal. This project aims at employing the vademecum-based paradigm for the modeling and prediction of granular flow with an expected impact on varied industrial branches, leading to tangible cost savings in both materials and energy consumption. Lastly, Dr. Gimenez has applied for the competitive ERC-CoG 2024. His disruptive URWIND idea aims to advance technology readiness in urban wind energy harvesting by developing high-fidelity predictive methods using the vademecum-based paradigm. The outputs will be used to study urban wind exploitation as well as advance sustainability and smart concepts in cities, addressing problems like pollution dispersion, air quality, pedestrian comfort, energy demand, and acting wind loads on urban structures.

**Resumen del Currículum Vitae:**

Juan Marcelo Gimenez Basile (JMG) obtained the degree in informatics engineering (2011), the master's degree (2014), and the PhD in engineering (2015) at UNL (Argentina). Since then, he has contributed on the development, implementation, and application of computational methods in fields of science and engineering. JMG has been hired as an assistant researcher (2017) and then promoted to associate researcher (2020) at CONICET (Argentina). In 2020, he moved to Spain to get a researcher position at CIMNE (Barcleona) where consolidates his own lines and achieves huge impact on the scientific community.

Dr. Gimenez has developed innovative numerical methodologies to study multiphase and turbulent flows, employing computational methods, machine learning, and high-performance computing technologies. Overall, he has published 32 contributions (h-index 11, Scopus Jan/2014). Research independence has been proven by being the first author in many of these publications (one work as sole author) and collaborating with internationally renowned researchers. Also, he has signed more than 40 works at national and international conferences and congresses. Concerning his teaching activity, JMG gave lectures at UNL (Argentina) on under- and post-graduate courses (2015-2020). His academic achievements include the supervision of three master's theses (finished), a PhD student (in progress), and recently was co-founder of a postdegree program.

JMG has obtained several funding sources for mobility: an Erasmus Mundus at UPM (Madrid 2014) and the highly competitive personal post-doctoral grant Severo Ochoa (Barcelona, 2020). In addition, he has successfully led four R&D projects. The latest is in progress: GRAIN (2022) is funded by MICIN (Spain) while JMG is the PI and supervises a hired researcher.

JMG has actively participated in high-technology transfer services: more than 10 services to commitments from diverse industries. He is an expert on the development of computational methods and implementation using diverse technologies. He has developed and released a set of innovative software tools related with his lines, being CpSimulator (2020) an excellent example of a science-to-technology breakthrough. Since 2022, Dr. Gimenez has held a part-time position as a consultant researcher at COMPASS IS. He leads R&D projects, where the software Eblader, devised by himself, is the latest outcome.

Dr. Gimenez has received several recognitions since being an undergraduate student. He won the best Argentinian GPA in informatics engineering, and diverse entities funded his doctoral and postdoctoral studies through fellowships. In 2021, he was awarded "AMCA Young Researcher," the most prestigious recognition for young Argentinian scientists in computational mechanics. He actively contributes to organizing scientific meetings. In 2019, he was co-director of the scientific committee of the Argentinian Congress MECOM and editor of the proceedings book. He regularly organizes and chairs mini-symposiums, e.g., at MECOM congresses (since 2019), CFC 2023, and PARTICLES 2023. Due to his internationally recognized expertise, he has been an invited speaker at scientific meetings and lecturer at international schools. His review tasks include the evaluation of PhD theses and active participation as an invited reviewer in internationally renowned journals and national grant programs.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | PAJARES MARTÍNEZ, ANDRÉS |
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| **Correo Electrónico:** | andrespajares89@gmail.com |
| **Título:** | Plasma control for fusion reactors |

**Resumen de la Memoria:**

Please see attached documents.

**Resumen del Currículum Vitae:**

Please see attached documents.

**Resumen de la Memoria:**

I am an ecologist focused on understanding the relationship between biodiversity and ecosystem functioning, and how this relationship is modulated by natural and human-driven environmental factors. My main research goal is to develop innovative and sustainable strategies for biodiversity and ecosystem services conservation in a global change scenario, such as Nature-Based Solutions.

I graduated in Environmental Sciences in 2006 from Rey Juan Carlos University (URJC, Spain). Afterwards, I obtained an MAEC-AECID Grant to develop my MS in 2010 from of San Luis Potosí Autonomous University (Mexico). During my two-year stay in Mexico, I carried out extensive field and laboratory work to better understand the link between biodiversity functional roles and species identity, and evaluate the effects of land use change on both biodiversity and ecosystem functions. In 2012, I defended my doctoral thesis with the highest qualification (cum laude) providing interesting insights into the relationship between biodiversity and natural and human-driven environmental gradients. The work developed during my MS and PhD allowed me to contribute to the advancement of science in the fields of functional diversity and land use change ecology, which led me to two short postdoctoral stays. The first, is at URJC, evaluating the effects of landscape fragmentation on biodiversity. The second, is at the University of Hiroshima (Japan), training students and researchers on functional trait ecology and evaluating how functional diversity responds to altitudinal gradients. Later, I obtained two Postdoctoral Fellowship funded by the Marie Sklodowska-Curie Actions. The first, at the University of Lisboa (Portugal, 2014-2016), was devoted to studying how functional diversity contributes to ecosystem services. The second, at URJC (Spain, 2018-2020), focused on demonstrating how species functional traits can be indicators of climate change and contributors to multiple ecosystem properties and functions.

Currently, I am working in the Freshwater Ecosystems group at the Instituto de Hidráulica Ambiental of the Universidad de Cantabria (IHCantabria). During the last couple of years, I have applied my previous knowledge of biodiversity and functional ecology, global change ecology and ecosystem services to better understand the interaction between terrestrial and aquatic ecosystems to work with BGINs as effective NBS for Integrated Catchment Management. My strong background in ecology and my research skills in advanced modelling and statistical analysis and my expertise in remote sensing techniques have allowed me to integrate into multiple research projects related to ecohydrology and water resource management (see Part C.3) and focus my research on: i) monitoring the spatio-temporal dynamics of freshwater ecosystems, ii) modelling ecosystem functions and processes associated to riparian zones (e.g., regulation of erosion and sediment dynamics, flood control, and thermal buffering), iii) quantifying riparian ecosystem services, and iv) developing innovative and sustainable approaches to manage and restore riparian ecosystems.

In line with my Career Development Plan, the Ramón y Cajal Fellowship will provide the new skills, knowledge and publication record needed to achieve my long-term goal of becoming a research leader in the field of Applied Ecology.

**Resumen del Currículum Vitae:**

Since 2008, I have authored 19 high-quality publications (1 letter in Science, IF = 59.94; 2 reviews) in SJR-indexed journals, 1 Factsheet (European Union) and 2 Proceedings, in collaboration with more than 75 co-authors from Spain, Mexico, Portugal, Italy, Bulgaria, Germany and others, resulting in an h-index = 10 and 543 citations. I am the first author of 13 of those publications (11 Q1, 7 P5, 1 invited issue) in recognized scientific journals in the fields of ecology, applied and environmental sciences (New Phytologist, IF = 8.51; Land Degradation and Development, IF = 8.20; Ecological Applications, IF = 6.11, Science of the Total Environment, IF = 5.59). Following the SCOPUS metrics, my work shows a 58% international collaboration, 58% of my documents are in top citation percentiles and 83% of them are in the top 25% journals.

I have participated in more than 20 research projects related to biodiversity, ecosystem functioning and services, global change, habitat degradation and restoration, river ecology and Nature-Based Solutions, demonstrating my professional maturity, independence and leadership. In particular, I am/have been PI of 5 research projects, 4 of them funded by competitive national and international calls, including 2 Postdoctoral Fellowships funded by the Marie Skodowska-Curie Actions (EU), 1 Bilateral project funded by the Fundação para a Ciência e a Tecnologia (Portugal) and 1 Grant for Young Researchers funded by the Asociación Española Ecología Terrestre. In total, I have raised ~330.000 euros in research funds as PI.

I have visited research centres abroad (Japan, Portugal and the USA) as a postdoctoral researcher, broadening my scientific culture and network. I have disseminated my work in more than 30 scientific congresses, workshops and national and international courses in the academic, social and industry sectors. I have participated in 4 grade and 5 advanced university courses and I have also supervised/I am supervising 1 Erasmus stay, 1 short-term scientific mission (COST Action), 1 Practicum, 2 Degree Final Projects, 2 Master Final Projects and 2 PhD thesis (ongoing), showing my interest to transfer my research experience and awaken the interest of students and young scientists in science.

Lately, I have also developed a great interest in knowledge transfer and science outreach, participating in research projects where the academy and environmental agencies work hand-by-hand, exchanging knowledge and experiences, and developing policy-oriented products (e.g., evidence-based environmental management guides, factsheets, policy briefs). I have also published press releases and participated in Open Days of Science to share scientific knowledge and methodologies with the general public.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | VALHONDO GONZALEZ, CRISTINA |
| **Referencia:** | RYC2023-045649-I |
| **Correo Electrónico:** | cvaqam@idaea.csic.es |
| **Título:** | Water renaturalization through Nature-Based Solutions |

**Resumen de la Memoria:**

My research delves into the biogeochemical processes involved in the fate and behavior of contaminants of emerging concern (CECs) from water. I work with natural-based solutions like Managed Aquifer Recharge (MAR) for water renaturalization and denitrifying woodchip bioreactors. A substantial facet of my work focuses on investigating parameters that govern the fate and behavior of contaminants at the solid-aqueous interface. This exploration aims to propose technologies that leverage natural processes for the enhancement of water quality during water interact with the porous media.

Specializing in the development of reactive barriers constitutes a focal point of my expertise, aiming to enhance water quality. The fundamental hypothesis driving my work posits that increasing electron donors promotes diverse redox conditions, thereby stimulating metabolic pathways within the microbial community and amplifying the degradation of pollutants. This innovative approach includes the installation of reactive barriers atop infiltration basins, resulting in reduced costs and heightened manageability. My proficiency in this area is evidenced by the successful design and operation of two Managed Aquifer Recharge sites, showcasing the effectiveness of this strategy. Another area of my expertise lies in examining the partitioning of organic contaminants among environmental compartments through adsorption and biodegradation tests and assessing the risks posed by the presence of such contaminants in the environment through toxicological assays.

My recent research is dedicated to comprehending the impact of intrinsic heterogeneity in natural systems on the fate of contaminants, particularly its influence on the localization of biogeochemical reactions. Additionally, I explore the significance of biofilm dynamics in shaping the fate and behavior of organic contaminants at the aqueous-solid interface.

**Resumen del Currículum Vitae:**

I am a Postdoctoral researcher at the Institute of Environmental Assessment and Water research (IDAEA-CSIC). I obtained my PhD, funded by the competitive JAE grant, in Geotechnical engineering and Geosciences at Polytechnic University of Catalonia (UPC) in 2017. My research focuses on unraveling the biogeochemical processes governing the fate and behavior of contaminants of emerging concern (CECs) in water. Utilizing natural-based solutions, such as Managed Aquifer Recharge (MAR) and denitrifying woodchip bioreactors, I aim to renaturalize water. An important aspect of my work involves delving into the parameters that control the fate of contaminants at the solid-aqueous interface. This exploration aims to propose technologies that optimize natural processes, thereby enhancing water quality within porous media. Recently, my research has delved into the role of intrinsic heterogeneity in natural systems concerning contaminant fate, particularly its influence on the localization of biogeochemical reactions. Additionally, I've investigated the significance of biofilm dynamics in shaping the fate and behavior of organic contaminants at the aqueous-solid interface. This line of research aligns with the PhD thesis of Jingjing Wang, a project I co-supervised, highlighting the prominence of biofilm-related processes in aquifers.

Active contributions to national and European projects(LIFE-ENSAT, LIFE-REMAR, JPI-Acwapur, JPI-MarAdentro, EIT-RAW Materials-NITREM) , coupled with authorship of 18 research papers, 2 book chapters, and 1 review, reflect my commitment to advancing scientific knowledge. I serve as a board member for IWA Publishing and Sustainability and actively participate as a reviewer for various peer-reviewed journals. Collaboration with international research groups (Georg-August University, Germany, GEUS-Denmark, Uppsala University, Sweden, CNR-Italy, CNRS-France, University of California-USA, University of Genova-Italy) is evident in 15 internationally authored publications. With over 70 presentations at national and international conferences, session organization (Goldshmidt-2019, IAH-Paris-2022), and workshop facilitation, I contribute significantly to knowledge dissemination.

I have actively contributed as both a reporter and an expert to water management agencies (Catalan water Agency-ACA, Water Consortium of Costa Brava, Aqualia, Comaigua, Comunitat d'Usuaris d'Aigües de la Vall Baixa de Delta del Llobregat-QUADLL).

My teaching journey began in 2017 within UPC's Master's degree program in Environmental Engineering and has expanded to my current role teaching in the Sea Science and Technology degree for the academic year 2023-2024. Over this period, I've been instrumental in co-supervising one PhD thesis, overseeing eight Master theses, and guiding two final bachelor theses. Additionally, I've undertaken roles as an examination panel member for three PhD dissertations and three master's theses.

**Resumen de la Memoria:**

My research career has been mainly focused on the investigation of river basins and coastal areas through analysis of field and laboratory measurements, development of advances numerical models and tools, study of engineering applications and proposal of management recommendations. This path began in the MSc in Environmental Hydraulics, in which I completed 2 specializations: Management of Ports and Coasts at the University of Granada (UGR), and Management of River Basins at the University of Cordoba (UCO).

Over my period as PhD candidate, I was based at the UGR and did 3 research visits to foreign centres. The main research outputs of my thesis, which was mainly focused on the analysis of field data and the development of numerical models to characterize the dynamics of deltaic areas, were 8 JCR papers in Q1 journals as first author, a book, 12 works in conferences and 2 intellectual property registers. My PhD Thesis received the outstanding award of the UGR, the IIAMA award for the best PhD Thesis in Spain in the field of water engineering, and the Enrique Fuentes Quintana award for the best PhD Thesis in Spain in the fields of engineering, mathematics, architecture and physics.

Later, I got the Juan de la Cierva-Formación contract at the UCO, where I worked on national and international research projects in the field of watershed and coastal engineering, carried out novel laboratory experiments in the hydraulic flume of the Department of Agronomy (Maria de Maeztu Excellence Unit), visited foreign institutions, and collaborated with many international experts. I authored 14 JCR papers in Q1 journals, a book and 2 intellectual property registers. All this work allowed me to get the Juan de la Cierva-Incorporación contract and move to the Polytechnic University of Valencia (UPV). At the UPV, I have worked on 6 research projects and contracts, led 5 project proposals, published 16 JCR papers and conference proceedings, led 4 Special Issues with foreign experts, organized 2 international workshops, and supervised and mentored 6 foreign students, among others. These activities have been focused on water resources engineering, which is the research line that I will develop in the coming years.

During my research career, I have worked continuously in research projects and technical contracts; led national and international project proposals; secured funding in competitive calls; supervised PhD, MSc, MEng and BEng students; and belonged to editorial boards of JCR journals, scientific-technical evaluation committees and other councils. I have also had an extensive mobility and internationalization activity, which includes: 6 research stays abroad, 22 research papers and 13 proceedings in collaboration with foreign institutions; 24 presentations in international research conferences; participation in 12 international research projects and contracts; 8 projects and grants got in competitive calls with foreign institutions; implementation of 3 models and 1 intellectual property register with foreign centres; organization of 3 international conferences and summer schools; membership in 14 international committees and editorial boards; lectures in 2 foreign universities and 2 international masters; supervision and mentoring of 6 foreign students; and 13 presentations and proceedings in international innovative teaching conferences, among others.

**Resumen del Currículum Vitae:**

I am a Juan de la Cierva-Incorporación researcher at the Polytechnic University of Valencia (UPV). I have a MEng in Civil Engineering (University of Granada-UGR, 2012) and an MSc in Environmental Hydraulics, with specializations in Integral Management of Ports and Coasts (UGR, 2013) and Integral Management of River Basins (University of Cordoba-UCO, 2014). I obtained my PhD (International Doctorate, Cum Laude) from the UGR, UCO and University of Malaga in 2017. My main research lines are water resources engineering, river engineering and coastal engineering, covering theoretical fundamentals, analysis of observations, numerical modelling applications and proposals of management recommendations.

The main advances and findings derived from my research activity have resulted in 39 JCR papers in the most relevant journals of my research area (36 in Q1, 27 in D1, 24 as first/corresponding author, 22 without my thesis supervisors). I have also authored over 45 contributions to research conferences and 3 books in Springer. I have 1406 citations (h-index 24) and 209 citations/year during my postdoctoral period. My research lines have been supported by research projects, contracts and grants. I have worked on 20 research projects (12 international, 4 national, 1 regional, 3 university), and got 4 research projects, 4 contracts (3 postdoctoral, 1 predoctoral), 3 grants for organizing conferences and 6 mobility grants in competitive calls (over 500000€ in total). I am also the PI of 2 project proposals that are currently under evaluation (1 international, 1 national, 357565€ in total).

I have been a visiting researcher at the University of Pisa, UCO, University of Plymouth, Deltares and University College Cork. My PhD Thesis was co-supervised by Prof. Masselink, I have 22 JCR papers with researchers from foreign institutions and have collaborated with 63 foreign centres through joint projects. I am Associate Editor of Journal of Marine Science and Engineering (Q1) and Frontiers in Energy (Q3), Academic Editor of Advances in Civil Engineering (Q3), and Editorial Board member of Science of the Total Environment (Q1), Water (Q2), Frontiers in Earth Science (Q2) and Energies (Q3). I have also been Guest Editor of 4 Special Issues in JCR journals, which have been co-edited by foreign experts, and reviewer for over 30 JCR journals and 4 foreign research councils. I have a 6-year research period recognized by CNEAI (2014–2019) and the R3 certificate (2023).

My research activity has also resulted in technological and social transfer. I have patented 4 intellectual property registers, authored 12 technical reports, and worked on 7 contracts with public or private entities. I have 16 works in innovative teaching conferences and numerous educational works, including a book. I also worked in an innovative teaching project. I have been a lecturer in 2 BEng Degrees (UGR 2015–2018, UPV 2023–,), 3 MEng Degrees (UGR 2018, EADIC 2018–, UPV 2021–), 3 MSc Degrees (UCO 2018–2020, UPV 2021–, CIHEAM 2022–), 2 training courses in Genoa and Granada (2018), and 4 technical courses for water managers (2022 and 2023). I have supervised a PhD Thesis (and 1 in progress), 8 MSc Theses (and 2

in progress), 2 MEng Final Projects and 9 BEng Final Projects, and mentored a German student from the University of Halle. I am accredited as Profesor Contratado Doctor by ANECA (2018).

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| **Área Temática:** | Producción industrial, ingeniería civil e ingenierías para la sociedad |
| **Nombre:** | BAYÓN CALDERÓN, CRISTINA |
| **Referencia:** | RYC2023-044613-I |
| **Correo Electrónico:** | cristina.bayc@gmail.com |
| **Título:** | The Power of Robotic Technology: revolutionizing the rehabilitation of neurological disorders |

**Resumen de la Memoria:**

I am a postdoctoral junior leader at the University of Twente (The Netherlands), and my research focuses on developing and implementing innovative robotic technologies to enhance motor capabilities of individuals with neurological disorders. My end goal is to increase the independence and improve the quality of life of those with movement restrictions.

My international career spans two continents and three countries, where I got several grants and awards that gave me the opportunity to start building my research line. Concretely, during my doctoral thesis (financed by a FPI grant at the CSIC) I demonstrated promising findings with the CPWalker robotic trainer by generating short-term improvements of walking ability and addressing shortcomings of common cerebral palsy (CP) rehabilitation. The CPWalker was the first robotic gait trainer that provided robotic assistance and bodyweight support during over-ground walking. This was a much-needed innovation, as until that time, all pediatric robotic trainers only provided assistance while walking on a treadmill. One of the visit abroad I carried out during my PhD concluded with the transfer of my academic research to clinical use: I started an important collaboration with the Shirley and Ryan Ability Lab (Chicago, USA), in which they acquired a copy of the CPWalker robotic trainer to evaluate its efficiency within a randomized clinical trial.

My subsequent steps after my PhD were focused on the development of new controllers to eventually enable gait assistance in daily-life activities and achieve long-term functional effects and independence of patients. In that regard, I have important contributions with international researchers on ideating new controllers for an automatic selection of the robotic assistance based on user's performance, as well as on bio-inspired controllers to support balance with exoskeletons.

My major achievement so far has been to get funding to carry out my independent research with the inGAIT project, which I am carrying out at this moment at the University of Twente. With this research I am creating new technological solutions to improve walking of children with CP in daily-life situations. It is awarded by the Dutch research council through a VENI NWO Talent Program (300 k€), the Dutch equivalent to the ERC starting grant.

The remarkable multidisciplinary character of my research has generated scientific impact in several peer reviewed international journal categories (e.g. rehabilitation and biomedical engineering, robotics, AI, automation and control systems, etc.). Moreover, my research has been covered more than 20 times in popular Spanish and Dutch media including TV shows, radio shows and newspapers. In addition, I am actively involved in social media (e.g. @inGAIT_CP, Twitter), where I spread my research not only among the scientific community but also among the general public.

My ambition is to be a key player in the evolution of robotic technology for rehabilitation, especially for pediatric population. With the Ramón y Cajal I will close the loop by involving the monitoring of daily-life gait in the personalization and prediction of the robotic control settings by means of artificial intelligence techniques. This is a revolutionary approach that will generate a long-lasting impact for scientific community in particular and society in general.

**Resumen del Currículum Vitae:**

I am currently a postdoctoral junior leader at the Department of Biomechanical Engineering at University of Twente, and my research focuses on developing and applying robotic technology to improve motor capabilities of people with neurological disorders.
I received the BSc. degree in mechanical engineering (2012) from VIA University College (Denmark) and the MSc. degree in industrial engineering (2013) from University of Extremadura (Spain). In 2018, I received the Ph.D. degree with honors (cum laude) in electrical, electronics and automation engineering from the University Carlos III of Madrid (Spain). It was awarded by the Economy and Competitiveness Ministry of Spain.
During my Ph.D., first in 2015, and subsequently in 2016, I was granted a fellowship of the Programme for the Training of Researchers of the Ministry of Economy and Competitiveness of Spain in I+D foreign centres. Within this programme I carried out two research visits: four months at Rehabilitation Institute of Chicago (USA, 2016) and three months at University of Twente (The Netherlands, 2017).
After my Ph.D. I was hired as a postdoc at the University of Twente (2018-2021). During these years I grew up as a researcher and got granted my first collaborative project as co-coordinator (BenchBalance, 2019-2021), as well as two very competitive individual grants: the Juan de la Cierva 2020 (50 k€), in Spain, in which I was the first candidate selected in my domain, and the VENI NWO Talent Program 2021 (300 k€), which I am currently carrying out at the University of Twente, being the Dutch equivalent to the ERC starting grant.

Some of the general quality indicators of my CV are:
PhD thesis defense: June 2018 (distinction summa cum laude with international mention)
Total citations (29/01/2024): Google Scholar: 525; Scopus: 254; ResearchGate: 418
h-index: Google Scholar: 10; Scopus: 8; ResearchGate: 10
Journal publications: 17
Journal publications Q1: 14
First author journal publications: 8
Last author journal publications: 1
Single author journal publications: 1

Conferences publications: 29 (23 international)
Master thesis supervised: 10

Personal grants, awards and honours:
- 2023: Joven Talento femenino, Comité Español de Automática (CEA).
- 2023: Permanent fixed position "Doctor Fuera de Convenio" at the CSIC. Profile: Robotics and Automation.
- 2022: Ada Byron award finalist, University of Deusto
- 2021: Ter Meulen Grant of the KNAW Medical Fund for scientific research abroad (5k€)
- 2021: Seal of Excellence by the European Commission for a Marie Sklodowska-Curie IF submitted under Horizon' 2020  (score 93.2/100)
- 2020: NWO VENI Talent Program postdoctoral individual fellowship, Dutch Research Council (300K€, success rate 11%)
- 2020: Juan de la Cierva Formación postdoctoral individual fellowship, Spanish Ministry for Science and Innovation (50K€, success rate 10%)
- 2017: Fellowship of the Programme for Researchers' Training from Ministry of Economy and Competitiveness of Spain at I+D foreign centers (5K€)
- 2016: Student Award Winner at International Society of Electrophysiology and Kinesiology (ISEK)
- 2016: Fellowship of the Programme for Researchers' Training from Ministry of Economy and Competitiveness of Spain at I+D foreign centers (6K€)
- 2014: FPI predoctoral fellowship for PhD contracts. Resolution of May 2014. Ministry of Economy and Competitiveness of Spain (83.9K€, success rate 20%)

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | GONZALEZ MARTIN, JAVIER |
| **Referencia:** | RYC2023-045769-I |
| **Correo Electrónico:** | javgonmar8@gmail.com |
| **Título:** | Desarrollo mecánico de detectores para dispositivos de fusión de confinamiento magnético |

**Resumen de la Memoria:**

I am a mechanical engineer that develops instrumentation to investigate and improve the confinement of energetic particles in fusion plasmas. The early phase of my PhD project was mostly experimental: I developed two new scintillator-based Fast-Ion Loss Detectors (FILDs) in the AUG tokamak. The movement of one of these new FILDs is produced by an in-vessel magnetic coil externally energized in real-time by the AUG plasma control system. This enabled the first real-time control of the FILD position including infrared measurements of its probe head temperature to avoid overheating. I used its fast collimator-slit sweeping to obtain radially resolved velocity-space measurements along 8 cm within the scrape-off-layer, providing direct evaluation of the neutral beam deposition profiles via first-orbit losses. These two new FILDs completed the first spatial coverage along the poloidal direction of a magnetically confined device, providing simultaneous measurements of the escaping fast-ion velocity-space, which are required to understand and avoid the loss of confinement in future fusion power plants.

Indeed, during my thesis, I already used the AUG FILD suite to study fast-ion interplay with MHD instabilities, especially with Alfvén eigenmodes (AEs). More precisely, I investigated the effect of externally applied 3D fields on fast-ion phase-space and their impact on AE stability. Aiming to fully understand this process, I modified the hybrid kinetic-MHD MEGA code to calculate the plasma response to these externally applied 3D fields, their impact on fast-ion distribution and therefore amplitude of destabilized AEs. These results (published on Physical Review Letters) indicate that slight modifications on the spatial spectrum of ELM-control coils can either destabilize or stabilize AEs in ITER, which in turn alters the confinement of fusion products, affecting the efficiency of the entire machine. These results recently inspired equivalent experiments at MAST-U (UK), KSTAR (Korea), DIII-D (USA), and are being considered in the design of ITER operation by the ITER science division.

**Resumen del Currículum Vitae:**

My multidisciplinary background was key to be appointed as a postdoc at Prof. Heidbrink's group at University of California, Irvine, to deploy at DIII-D the first Imaging Neutral Particle Analyzer(INPA) able to measure the phase space occupied by fast ions on multiple different orbit topologies. This new INPA system is capable of visualizing distributions of fast ions on the selected orbit topology and its associated orbit topological boundaries. The diagnostic can therefore directly visualize the effective pitch angle scattering across phase space induced by drift waves and its interaction with AEs, a key issue towards a future fusion power plant.

Regarding modeling, I applied the MEGA code to reproduce the first ever visualization of AE- induced fast-ion flow. These results (published on Physical Review Letters and Nuclear Fusion) illustrate how the simulated phase space flows can differ significantly from those predicted by a perturbative model with fixed eigenmode structure and frequency. These results are being considered in reduced models (NUBEAM/TRANSP) since its appropriate implementation would be critical to a successful prediction of fast ion and bulk plasma confinement of future devices.

During my postdoc at DIII-D, I started a collaboration with Dr. A. Tingely and Dr. N. Howard from MIT Plasma Science and Fusion Center in simulations of alpha particle behavior in the JET and SPARC tokamaks. This collaboration is still active and motivated a 10-weeks stay at MIT even after my postdoc at DIII-D was concluded.

I returned to Europe for a second postdoc (thanks to a Juan de la Cierva fellowship and an EUROfusion Researcher Grant) to apply the experience gained over these years at DIII-D in both diagnostic engineering and physics analysis to the deployment of fast-ion loss diagnostics in advanced tokamaks such as JT-60SA and ITER, with the goal of confining energetic ions such as fusion products in future fusion power plants. Furthermore, since August 2023, I lead the execution of a contract for the design of the ITER FILD, which I earned on a public bidding with the ITER Organization. This allowed me to lead a small team (so far 6 people) of engineers and physicists, producing the thermal analysis, engineering models, and signal estimations for the ITER FILD as well as planning its prototype for the probe head and light acquisition systems. This group is embedded in the laboratories of the Department of Mechanical Engineering and Manufacturing (DMEM) and the University of Seville joint research institute "Centro Nacional de Aceleradores" (CNA), a top-notch particle accelerators facility hosting neutron (109 n/sr and up to 15 MeV) and gamma (up to 1.25 MeV) sources.

As of today, this research was disseminated via 32 articles (5 of which as main author) and 54 conferences (10 as main author).

**Área Temática:**     **Producción industrial, ingeniería civil e ingenierías para la sociedad**
**Nombre:**     AGUIRRE  FONT, MIQUEL
**Referencia:**     RYC2023-042592-I
**Correo Electrónico:**     miquel.aguirre@gmail.com
**Título:**     Mecánica computacional basada en datos para el diagnóstico y tratamiento de trastornos trombóticos

**Resumen de la Memoria:**

Soy ingeniero de caminos, canales y puertos por la Universitat Politècnica de Catalunya (Barcelona, 2008) y doctor en mecánica computacional por la Swansea University (Reino Unido, 2014). Actualmente soy investigador María Zambrano en mecánica computacional en el grupo de investigación LaCàN (UPC) y adscrito al Centro Internacional de Métodos Numéricos en Ingeniería (CIMNE). Mi tesis doctoral fue dirigida por Javier Bonet y Antonio Gil, y fue financiada por una beca Marie Curie, dentro de un Marie Curie Initial Training Network , coordinado por Antonio Huerta (CIMNE, UPC). Posteriormente, trabajé entre 2014 y 2016 como investigador postdoctoral en el grupo de C. Alberto Figueroa, University of Michigan (EUA), focalizando mi investigación en el desarrollo de técnicas de mecánica computacional para la medicina cardiovascular. Seguido, trabajé como investigador senior en Tecnalia Research and Innovation (Derio, Bizkaia) y a partir de Julio 2018 me incorporé al grupo de Stéphane Avril en el " Centre Ingénierie et Santé", un centro mixto de INSERM y Mines Saint-Étienne (Francia), como investigador postdoctoral, trabajando en el desarrollo de algoritmos para la modelización rápida de dispositivos médicos. En junio de 2019 conseguí, después de pasar un concurso competitivo, una plaza de 3 años "Maître Assistant Associé – Tenure Track" en ese mismo centro, donde desarrollé mi propia línea de investigación en mecánica computacional e inteligencia artificial aplicado a la medicina cardiovascular. En junio de 2022, pasé un segundo concurso competitivo para obtener una plaza permanente como "Maître des Conférences" en ese mismo centro, sin embargo, rechacé dicha plaza a favor de mi plaza actual de investigador María Zambrano en la UPC/CIMNE, donde continuo mi línea de investigación, con un fuerte énfasis en enfermedades trombóticas. Actualmente, dirijo el proyecto MECA-ICTUS, financiado por la Agencia Estatal de Investigación, donde desarrollamos técnicas de mecánica computacional e inteligencia artificial para la toma de decisiones rápida en el tratamiento del ictus isquémico. Tengo un total de 14 publicaciones en revistas científicas internacionales (12 Q1, 2 Q2), 1 patente y 37 ponencias en conferencias internacionales. He co-supervisado 4 estudiantes de doctorado (3 en curso), 2 postdocs (en curso) y 6 estudiantes de máster. Estoy acreditado como " professor agregat" y "professor lector" por la Agència per a la Qualitat del Sistema Universitari de Catalunya y como "maître de conférences" por el Ministerio de la Educación Superior de Francia. Asimismo, soy miembro de la European Society of Biomechanics. He trabajado como evaluador para la Fundación para la Ciencia y la Tecnologia de Portugal y estoy incluido, recientemente, como experto en el banco de evaluadores de la Agencia Estatal de Investigación.

**Resumen del Currículum Vitae:**

Tengo más de 13 años de experiencia en el desarrollo de técnicas nuevas de mecánica computacional, especialmente en problemas no lineales de sólidos, para aplicaciones relevantes en ciencia e ingeniería. Durante mi doctorado, creamos una nueva formulación mixta de sólidos que resolvíamos mediante técnicas típicamente usadas en dinámica de fluidos (CFD), y que solucionaba problemas numéricos muy comunes en elementos finitos clásicos. Desde mi postdoc en la Universidad de Michigan, me especialicé en el uso de estas técnicas para la medicina cardiovascular. Allí, implementé un solver de interacción-estructura no lineal para la simulación del flujo sanguíneo en el cuerpo y un solver de elementos tipo shell para simular la mecánica de los vasos sanguíneos. Durante el año y medio que trabajé como investigador en Tecnalia, dejé brevemente aparcada la medicina cardiovascular y me focalicé en el diseño de nuevas líneas de investigación en mecánica computacional para aplicaciones en ingeniería civil. Asimismo, codirigí un trabajo de investigación con la Universidad de Burgos, donde combinábamos el uso de técnicas experimentales con técnicas numéricas para comprender mejor la rotura del hormigón de árido reciclado. Durante mi postdoc de 1 año en Mines Saint-Étienne, creé una nueva formulación para simular de forma rápida y precisa el contacto de elementos tipo viga contra superficies, con el objetivo de simular el despliegue de dispositivos endovasculares. Siguientemente, al obtener la plaza de " Assistant Professor, Tenure-Track" desarrollé mis propias líneas de investigación en simulación rápida para la planificación de cirujías y resolución de problemas inversos para el diagnóstico de enfermedades cardiovasculares. Durante ese tiempo, codirigí 4 tesis doctorales y 1 postdoc en distintos ámbitos tales como: uso de mecánica computacional y aprendizaje automático para la planificación de stenting de aneurismas cerebrales, simulación numérica del efecto de la dismorfía plantar en el retorno venoso, simulación experimental y numérica del efecto de stent-grafts abdominales en el flujo sanguíneo, uso de modelos unidimensionales de flujo sanguíneo y aprendizaje automático para la detección del ictus isquémico y modelos de orden reducido para mejorar el tratamiento del linfedema. En mi plaza actual, como investigador María Zambrano en la UPC y CIMNE, sigo estas líneas de investigación, con un fuerte énfasis en el diagnóstico y tratamiento de enfermedades trombóticas. He conseguido consolidarme en este ámbito a través del proyecto MECA-ICTUS (ver CV), donde desarrollaremos técnicas de mecánica de sólidos (contacto, grandes deformaciones, fractura) y aprendizaje automático para mejorar la planificación de la trombectomía en pacientes de ictus isquémico. En dicho proyecto estoy supervisando un postdoctorando y hemos empezado una colaboración con la unidad de ictus del Hospital Clínic de Barcelona. En el futuro me gustaría crecer en esta línea de investigación con el objetivo de atacar problemas de amplio recorrido tales como: diagnóstico precoz de la trombosis venosa profunda, predicción del efecto de fármacos en el tratamiento de la trombosis, identificación de parámetros materiales y edad de trombos a partir de datos clínicos o screenings rápidos y seguros para embolias pulmonares.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | BORAU ZAMORA, CARLOS |
| **Referencia:** | RYC2023-042524-I |
| **Correo Electrónico:** | carlos_borau@hotmail.com |
| **Título:** | Experimentación y desarrollo de modelos computacionales para la comprensión del papel de la mecánica en el comportamiento celular: aplicación en cáncer y medicina regenerativa. |

**Resumen de la Memoria:**

My background encompasses diverse multidisciplinary applications ranging from purely theoretical-computational studies to fully experimental approaches. The guiding and common thread of my research is the understanding of the effect of cell microenvironment on cell response from a mechano-chemical perspective and ranging several time a space scales (from the dynamics of cell cytoskeleton at the microscale to the behavior of tissue and organs at the macroscale). Aside from improving the understanding of biological processes, the final goal is to use this knowledge in the development of practical solutions applied to cancer, regenerative medicine or other medical conditions. In particular, the aim of my main ongoing research line is to create hydrogel-scaffold constructs to mimic the extracellular matrix for skin healing solutions.

The current reference standard of skin loss, skin grafting (transplantation), is limited in terms of donor site availability, and it leaves a scar that differs chemically, architecturally, and mechanically from the native skin. Therefore, regeneration of the skin without functional or aesthetic deficit remains the ultimate goal of wound-healing. With my research I aim to predict the best skin construct fabrication parameters for a specific combination of necessities (e.g. geometry of the wound, mechanical behavior and biological environment) based on an inverse regression model and functional statistics, combining finite element modeling with experimental data and image processing. Furthermore, I plan to create an open software tool (library) to automatically generate the necessary files (gcode) for a 3D printer to directly obtain the optimized scaffold geometry and printing parameters. This research line is a step forward not only at a scientific level (all the knowledge associated with cellular interactions with their microenvironment) and technical level (printing and characterization of scaffolds), but also at a practical level (generation of a predictive tool and a printing library). Its findings could be part of the next generation of skin constructs providing all the complex but necessary cell environment such as biocompatibility, structural integrity, appropriate mechanical properties and integration into the host tissue environment with vascular and neural connectivity. This research would have a strong economic and social impact, making it possible to: (i) propose rapid therapeutic regimens for each patient according to the characteristics of the tissue to be replaced, (ii) evaluate which material-geometrical properties of a potential scaffold fit perfectly to the tissue to be replaced (e.g. depending on the skin body site), (iii) save failed printing attempts and experimentation thanks to the predictive model, iv) create an "off-the-shelf" product for daily use in the clinic. Patients and society will benefit greatly from such a platform/product, which would, in the future, propose complementary experimental approaches to define new therapeutic options adapted to each patient. The medical devices developed would remain at the forefront of advanced therapies, contributing substantially to the growth of the global market in biotechnology with the final ambitious goal of reaching day-to-day clinical use.

**Resumen del Currículum Vitae:**

I am a researcher used to managing projects and people, with strong leadership, organizational, planning, and hard work skills. With an Industrial Engineering background, I obtained my PhD in Computational Mechanics in 2013. I gained experience in mechanics, computational modelling and biomedical image analysis during research stays at Massachusetts Institute of Technology (USA) and at the Center for Medical Physics and Technology (Germany), giving me the ability to tackle complex biomechanical problems and develop innovative solutions. I won the European Society of Biomechanics Thesis Prize in 2013 and delivered an invited lecture at the 7th World Congress of Biomechanics held in Boston in 2014.

I have supervised 4 master, 10 bachelor and 3 PhD students, and participated in 16 research projects as part of the Multiscale Modelling in Biological Engineering (M2BE) group, actively contributing to fundraising, and leading, as post-doc, four recent projects on microscopy image analysis, modelling cell behaviour and fabricating biomedical scaffolds.

I have published 30 JCR papers in collaboration with many international researchers and organized several conferences and sessions, also participating as review editor in prestigious journals. My research, presented in over 40 conferences to date, spans computational modelling of biomechanical problems and developing software for image processing and other utilities. In fact, I present a strong multidisciplinary background including: mechanics, statistics, image processing, data analysis, coding and modelling, which is particularly useful for a multifaceted field such as biomechanics, making me a valuable asset within the group.

I have combined my research with teaching in different knowledge areas and app development in the industrial sector, and continue to expand my expertise in machine learning and GPU use, largely thanks to my recent stay at the Research Software Engineering group of the Department of Computer Science of the University of Sheffield (United Kingdom).

I am a strong advocate for open science, and, as such, most of my publications are open access. In fact, many of the codes used (along with vauable apps) are shared online through public repositories.

Additionally, I have a notable track record of effectively communicating complex results to non-expert audiences, including contributions to local media, school visits, and seminars in master's programs.

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| **Área Temática:** | **Producción industrial, ingeniería civil e ingenierías para la sociedad** |
| **Nombre:** | LIZANA MORAL, FRANCISCO JESUS |
| **Referencia:** | RYC2023-042521-I |
| **Correo Electrónico:** | lizanafj@gmail.com |
| **Título:** | ALMACENAMIENTO Y GESTIÓN DE LA ENERGÍA TÉRMICA HACÍA EDIFICIOS DE BAJA EMISIÓN DE CARBONO |

**Resumen de la Memoria:**

La presente trayectoria investigadora se ha focalizado en el desarrollo y validación de materiales, sistemas, aplicaciones y estrategias de actuación para el almacenamiento y la gestión de la energía térmica en edificación, con el objetivo de hacer frente al objetivo de descarbonización de la calefacción y refrigeración, responsables de casi el 50% del consumo de energía final, siendo el 75% todavía basado en combustibles fósiles. Su línea de investigación se ha centrado en 4 áreas: MATERIALES, SISTEMAS, EDIFICACIÓN Y PLANIFICACIÓN ESTRATÉGICA.

En el área de investigación MATERIAL, la investigación se ha centrado en la identificación, caracterización, desarrollo y validación de nuevos materiales para el almacenamiento térmico a través de técnicas experimentales en laboratorio. En el área de SISTEMAS, la investigación se ha focalizado en la evaluación de técnicas de integración de las soluciones de almacenamiento e intercambio de calor en edificios a través de modelos numéricos (evaluaciones "bottom-up"). En EDIFICACIÓN, la investigación se ha centrado en la evaluación de las necesidades y demandas del parque edificado a través de estudios de campo. Y en PLANIFICACIÓN ESTRATÉGICA, los trabajos se han centrado en la identificación de planes de acción según las estrategias óptimas de implementación a escala local y/o nacional a través de modelos numéricos de análisis (evaluaciones "top-down"). Dicha línea de investigación ha derivado en la siguiente trayectoria:

Como contribuciones científico-técnicas, la línea abarca 31 artículos en revistas científicas JCR, 4 capítulos de libro y 26 comunicaciones a congresos internacionales, obteniendo un índice h19 y 1514 citas. La investigación ha sido financiada a través de 10 ayudas y contratos de excelencia obtenidos en convocatorias públicas competitivas, englobando una Juan de la Cierva en el CSIC y una Marie Curie en la Universidad de Oxford. El candidato ha contribuido a 15 proyectos de i+D (2 internacionales, 4 europeos y 9 nacionales), ha sido IP del proyecto H2020 MSCA ResCool en Oxford. Participa con regularidad en actividades de divulgación y gestión. Su trayectoria ha sido ampliamente reconocida, destacando el 1er Premio nacional a la mejor tesis doctoral por el Grupo GECAT, 1er Premio Joven a la Cultura Científica 2018; y 1er Premio Internacional YEAR AWARD 2018.

En cuanto a Movilidad e internacionalización, ha desarrollado 3 estancias predoctorales de 3 meses en The University of Edinburgh, Technical University of Munich, Universidade de Lisboa; y 3 estancias postdoctorales en la Universidad de Sevilla, el CSIC y la University of Oxford. Resultado de dichas estancias, junto con la participación en 2 proyectos internacionales y 4 europeos, han publicado 16 artículos JCR en colaboración internacional y 1 patente.

En relación con actividades de Liderazgo, el candidato es en la actualidad Associate Professor en la Universidad de Oxford, y lidera el programa de "Zero-Carbon Space Heating and Cooling" del Zero Institute en Oxford. Además, coordina de un equipo de trabajo en el programa "Future of Cooling" de la Universidad de Oxford. Ha publicado con más de 15 instituciones internacionales, es miembro del consejo editorial de diversas revistas JCR, chair en congresos internacionales, revisor de proyectos europeos y colabora con diversos grupos e instituciones internacionales.

**Resumen del Currículum Vitae:**

El Dr. Jesús Lizana es experto en ingeniería térmica en edificación y simulación avanzada. Dr. Lizana es licenciado en Arquitectura por la Universidad de Sevilla (2013), Master Universitario en Peritación y Reparación de Edificios (2015) y Doctor por la misma universidad (2019). Su investigación ha sido financiada a través de 10 ayudas y contratos de excelencia de convocatorias públicas competitivas, lo que le ha permitido desarrollar su doctorado con un contrato de Formación del Personal Universitario(FPU), consolidar su etapa postdoctoral con un contrato Juan de la Cierva(JdC-F) en el CSIC y una Marie Curie Fellowship (MSCA) en la University of Oxford, y abordar investigaciones interdisciplinares a través de estancias internacionales en la University of Edinburgh, la Technical University of Munich y Universidade de Lisboa. Cuenta con acreditación Prof. Contratado Doctor (ANECA).

En la actualidad, Dr. Lizana es Associate Professor en el departamento de Engineering Science en la Universidad de Oxford, y lidera el programa de "Zero-Carbon Space Heating and Cooling" del Zero Institute. Además, es responsable de un grupo de trabajo de cuatro jóvenes investigadores en el programa "The Future of Cooling". Imparte docencia y colabora en actividades de supervisión de estudiantes de máster y doctorandos. Además, co-dirige a estudiantes de doctorado en la University of Edinburgh y la Universidad de Sevilla.

Dr. Lizana ha contribuido a 15 proyectos de i+D (2 internacionales, 4 europeos y 9 nacionales), cuenta con 31 artículos en revistas científicas JCR, 1 libro, 4 capítulos de libro y 26 comunicaciones a congresos internacionales, obteniendo un índice h19 y 1514 citas. Destacan sus contribuciones científicas en almacenamiento de energía térmica y la descarbonización de la calefacción y refrigeración. Su investigación ha englobado investigación experimental y numérica, destacando uno de sus trabajos en Nature Sustainability, y otro en la categoría de artículo altamente citado. Además, 16 de sus publicaciones son resultado de colaboraciones internacionales.

Es revisor frecuente de revistas científicas y congresos, comité científico-técnico de congresos internacionales (CICSE, SDEWES), y editor de las revistas Sustainable Cities and Society (JCR, Q1, IF: 10.696) y Frontiers in Built Environment (JCR, Q2).

Destaca su capacidad de transferencia y aportación a la sociedad a través del desarrollo de una patente, la participación en 5 proyectos financiados por empresas, y consultor de instituciones internaciones, con proyectos en Reino Unido, India, España, Marruecos y Arabia Saudí. Además, desarrolla

actividades de divulgación en medios cómo TheConversation, TheTimes, Cadenaser o Housing Matters y colabora con frecuencia en programas de promoción de la investigación en escuelas (Science is Wanderful, Jóvenes con Investigadores).

Su trabajo investigador ha sido reconocido en numerosas ocasiones, destacando el 1er Premio nacional a la mejor tesis doctoral por el Grupo GECAT de la Real Sociedad Española de Química y la Real Sociedad Española de Física (1000€); 1er Premio Joven a la Cultura Científica 2018 del Ayuntamiento de Sevilla/CSIC (4000€); el 1er Premio Internacional YEAR AWARD 2018 por la Asociación Europea de Jóvenes Investigadores; premio extraordinario de doctorado; y accésit en "Tu tesis en 3 minutos".

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
## Turno General

**Área Temática:** Psicología
**Nombre:** NOGUEIRA MAÑAS, RAMON
**Referencia:** RYC2023-043805-I
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**Título:** The neurobiological basis of cognition: integrating neural activity, behavior, machine learning and artificial neural networks

### Resumen de la Memoria:

I graduated Physics as "Premio Extraordinario" in 2011 (UAB) and in 2012 I graduated a master degree in Theoretical Physics (UB). In September 2012 I started a PhD in computational neuroscience in the lab of Prof. Ruben Moreno-Bote at UPF (2012 - 2017), where I published in Nature Communications and The Journal of Neuroscience as first author (among others).  n December 2017 I joined the Center for Theoretical Neuroscience (CTN) at Columbia University (New York, USA) as a postdoctoral researcher (Prof. Stefano Fusi), which is part of the Zuckerman Institute (ZI) where I published in Nature Neuroscience, Cell, Neuron and Nature Communications (among others).  In January 2024 I started my own lab as an Assistant Professor in the Department of Neurobiology at University of Chicago (USA). I have been awarded a start-up package of $1.2million and I will teach "Machine Learning methods in Neuroscience" in the undergraduate program at U. Chicago.

My long-term goal as an independent researcher will be to work closely with experimental researchers and use my skills as a computational neuroscientist to shed light onto the neurobiological basis of cognitive processes like perceptual decision-making, working memory and attention. In particular, my main goal will be to understand what is the geometry of the representations in the different areas of the brain and how they support these cognitive functions (Nogueira et al. 2023, Rigotti et al. 2013, Bernardi et al. 2020). My general approach to research in neuroscience will be based on the combination of (i) theoretical models of the neural code, (ii) analysis of complex behavior and neural activity using state-of-the-art ML, and (iii) train ANNs to perform relevant tasks in neuroscience to validate the experimental results and derive additional predictions. I firmly believe that in the next few years, neuroscience will experience the most important break-throughs at the intersection between complex experimental datasets, ML and ANNs. Furthermore, an additional goal as an independent researcher will be to shed light onto the computational basis of psychiatric disorders and help reduce the burden they impose on our society.

The combination of my strong mathematical background, my experience on modeling and computational neuroscience, and my experience on leading experimental collaborations, represent my strongest feature and makes me confident about my potential to successfully run an independent research group.&#8239; Moreover, my years as a PhD student and a postdoctoral researcher at the Center for Theoretical Neuroscience and Zuckerman Institute (Columbia University), have given me an ample vision of the current state of the field and have provided me with a network of international collaborators (both theoretical and experimental) in Spain, UK, Canada, and the USA. With all these ingredients combined I expect to publish the research from my lab in top journals and conferences in neuroscience and cognitive sciences. I also plan on summarizing and tailoring my results for a broader audience and disseminate my scientific findings on newspapers and social networks. I also greatly enjoy teaching and mentoring, and I am looking forward to doing so with the members of my own lab. I also like communicating my scientific results and networking, two desirable skills for successful researchers.&#8239;

### Resumen del Currículum Vitae:

I graduated Physics as "Premio Extraordinario" in 2011 (UAB) and in 2012 I graduated a master degree in Theoretical Physics (UB). In September 2012 I started a PhD in computational neuroscience in the lab of Prof. Ruben Moreno-Bote at UPF (2012 - 2017). During my graduate years I studied the integration of sensory with prior information on perceptual decision-making in rats (Nogueira et al. 2017) and the role of population tuning and correlated variability on encoded information and behavioral performance (Nogueira et al. 2020), which set some of the foundations for a number of follow-up studies I was involved in (Roussy et al. 2021, Kafashan et al. 2021, Balaguer-Ballester et al. 2020). In Nogueira et al. 2020 I derived mathematically a set of predictions that were later tested in different datasets encompassing three different behavioral tasks and two brain regions. I also wrote and contributed on two review articles (Nogueira et al. 2018, Arandia-Romero et al. 2017).

In December 2017 I joined the Center for Theoretical Neuroscience (CTN) at Columbia University (New York, USA) as a postdoctoral researcher (Prof. Stefano Fusi), which is part of the Zuckerman Institute (ZI). The ZI is a world-renowned institution directed by two Nobel Prize laureates. During my years at the CTN I have mostly worked on characterizing the geometry of representations in mouse somatosensory cortex (S1) during perceptual decision-making, which has been published in Neuron and Nature Neuroscience (Rodgers et al. 2021, Nogueira et al. 2023). As a postdoc I have also worked on the role of sparseness on the trade-off between generalization and discrimination (Nogueira and Fusi, 2021). I have also presented my work at several international conferences (COSYNE 2018-2022; CNS 2019; CCN 2019) and international meetings (Gatsby Tri-Center meeting 2021; Neuromatch 2020; ZIPS 2021), and I organized the workshop "Is geometry all you need?" in COSYNE 2022 (17-22 March, Lisbon). I have also organized a reading group ("RANN", 2018 - 2021) and a seminar series ("NeuroNex", 2020) at the CTN. I have been a TA in a graduate-level course at the CTN ("ACCN" 2018 - 2019), a summer school on modelling of behavior ("BAMB" 2019, Barcelona), and I have mentored three students as part of the "Leadership Alliance Program" in 2021 and 2022. Since 2019 I am also a regular scientific reviewer for top journals and conferences in computational neuroscience and cognitive sciences: Nature Neuroscience, Nature Communications, Plos Computational Biology, and COSYNE, among others.

In January 2024 I started my own lab as an Assistant Professor in the Department of Neurobiology at University of Chicago (USA). I have been awarded a start-up package of $1.2million and I will teach "Machine Learning methods in Neuroscience" in the undergraduate program at U. Chicago. My group currently consists of two PhD students and three postdocs. The combination of my strong mathematical background, my experience on computational neuroscience and experimental collaborations, my publications on high-impact factor journals, my network of international collaborators, and my

international experience on organizing scientific events, teaching and mentoring students, represent my strongest assets and make me confident about my potential to successfully run an independent research group.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Psicología
**Nombre:** WOKKE , MARTIJN
**Referencia:** RYC2023-045498-I
**Correo Electrónico:** martijnwokke@gmail.com
**Título:** Chasing down internally generated information in the brain

**Resumen de la Memoria:**

Please close your eyes for a moment and consider what you will be doing tomorrow. While you are thinking about appointments, dinner plans or a physical activity, something very intriguing is happening: You are mentally navigating through a simulated future created by your brain. Although thinking about tomorrow just now might feel like a deliberate process, internally generating information appears to be a fundamental and intrinsic aspect of how the brain operates. Remarkably, while much effort has been dedicated to understanding how external information is processed, the realm of internally generated information in the brain remains somewhat of a mystery. For example, when you see a person for the first time, your brain automatically starts to internally generate all kinds of ideas or hypotheses about this person that goes far beyond directly observable information; when playing tennis, various next action possibilities are internally simulated at the speed of light in order to hit the right shot. But also sometimes late at night, your brain might bother you with the generation of troublesome possible future scenarios that keeps you from your precious sleep. These examples show that the brain's intrinsic information generation machinery operates with different levels of awareness and control to guide our behavior and to shape our thinking.

My main research line seeks to characterize how the human brain rapidly integrates currently available external information with internal (prior) knowledge, giving rise to perception, inferences, metacognition, reasoning, and further complex cognitive behavior. During both my predoctoral and postdoctoral career, I have combined newly constructed experimental designs with neuroimaging, brain stimulation techniques, and advanced analyses.

Initially, I mainly focused on how conscious visual perception emerges in the brain. After setting up a new brain stimulation lab in Amsterdam, I was able to demonstrate how the brain's so-called internal models of the world influence primary sensory brain areas in a top-down manner to produce conscious perception.

Next, I constructed several novel designs to investigate the brain's estimates about the quality of our decisions. During my Marie Sklodowska Curie Global Fellowship, I combined a novel experimental design with EEG, brain stimulation and machine learning to examine how structure and regularities in the world can enable the brain to infer upcoming events. Notably, we found that the brain can form and utilize internal models of the world even without conscious awareness of acquired knowledge.

The last two years, I worked at the University of Granada and at New York University. During this period, I focused on expanding and strengthening my research niche by acquiring cutting-edge methodological skills and developing innovative theoretical frameworks (at Dr. Biyu He's lab). These endeavors led to the successful construction and piloting of three novel experimental designs, which do not only address immediate research questions but also provide a solid foundation for my long-term research program that aims to deepen our understanding of internally generated information, and unravel the mysteries of how the brain gives rise to maybe one of the most determining aspects of ourselves: our thoughts.

**Resumen del Currículum Vitae:**

I have conducted research in highly esteemed labs across six different countries: Amsterdam, Brussels, New York, Cambridge, Tokyo, and Granada. During this time, I received four prestigious grants for my work and initiated a collaboration between industry and academia. Working in various internationally recognized research environments has given me the opportunity to view scientific research and mentoring from diverse perspectives and to establish a broad international network.

In my projects, I integrate behavioral psychophysics with neuroimaging, brain stimulation, and machine learning to explore pressing questions in cognitive neuroscience. I initiated four intercontinental projects, reflecting my ability to independently lead challenging research programs and mentor and (co-)supervise students, PhD candidates, and a postdoctoral researcher. My recent work has been published in top cognitive neuroscience journals, with the majority of my articles featured in Q1 journals and one in a Q2 journal. I have consistently taken the initiative and independently formulated the main research questions for most of my studies, often constructing novel experimental designs from scratch, selecting the most suitable analytical and neuroimaging methods, and leading the data analyses.

My research has fostered collaborations beyond academia, such as with the Rietveld Art Academie and Sony Computer Science Labs. Although my background is in psychology and neuroscience, my collaborative efforts span various disciplines, as evidenced by my work with NYU Langone Medical Center, Sony Computer Science Labs, and a clinical psychology group in Venice.

At NYU, I have heavily invested in enhancing my methodological expertise (i.e., machine learning) and developing innovative (brain inspired) theoretical models to understand the brain's internal processes, such as internal information generation, the emergence of thoughts, creative problem-solving, and inferential decision-making. These efforts provide a fertile and solid basis for my long-term career goal of establishing a cognitive neuroscience laboratory in Spain.

Alongside my research, I've been an active contributor at international conferences, frequently presenting my findings as a speaker. I've organized symposia, workshops, and a conference, bringing together experts from across the globe to advance our collective understanding of cognitive neuroscience. Additionally, I consider it vital to involve the general public in science. I have organized and participated in numerous outreach events, including Research days, webinars, and Science Slams in Amsterdam, New York, and Spain, and provided educational demonstrations to high school students.

In sum, my research journey is driven by a profound commitment to advancing cognitive neuroscience through innovative methodologies and interdisciplinary collaboration. At the core of my work is a deep belief in the transformative power of understanding the human brain —not just for scientific advancement but also for societal benefit. As we navigate the complexities of the digital age, my goal remains steadfast: to explore, elucidate, and apply the intricate workings of the brain in ways that enhance human potential and well-being.

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| **Área Temática:** | Psicología |
| **Nombre:** | BABO REBELO, MARIANA |
| **Referencia:** | RYC2023-042702-I |
| **Correo Electrónico:** | mariana.b.rebelo@gmail.com |
| **Título:** | The bodily roots of self-consciousness |

**Resumen de la Memoria:**

My research focuses on the psychological and neural mechanisms of self-consciousness, particularly on their links with the body. My scientific approach has been characterized by testing psychological questions with behavioral and electrophysiological data, performing several replications of initial findings, investing in rigorous control analyses and testing large and representative datasets when possible.

My PhD work (ENS, Paris) provided a mechanistic account of self-consciousness, showing its relationship with brain-heart coupling. Using magnetoencephalography and intracranial electroencephalography, I showed that cognitive processes that involve the self (i.e. spontaneous thoughts, imagination) are associated with enhanced heart-brain coupling, assessed through heartbeat-evoked responses (HERs). HERs in the precuneus increase when the self is engaged as an agent, or protagonist of a mental scene ("I"), while HERs in the ventromedial prefrontal cortex increase during introspective processes ("Me"). I thus proposed that by referring to a signal that is inherently anchored to the self, i.e. HERs, the brain would tag neural processes as being self-related or not. This work proposed a novel framework for the self, distinguishing the "I" and "Me" dimensions, and it revived the measure of HERs.

Next (post-doc UCL, London), I focused on a specific first-person subjective process, aesthetic experience, to see how it may influence spatial reference frame use – either egocentric, centered in the body, or allocentric, centered in the environment. I found that positive aesthetic experiences are preferentially remembered under an egocentric reference frame. The first-person perspective of subjective experience transfers to the spatial domain, creating a unified first-person perspective. This project involved a collaboration with non-academic partners, a museum (MoCDA) and a virtual reality company (Hobs3D), and led to several dissemination activities to the general public.

Currently (post-doc EPFL, Geneva), I am investigating the bodily roots of autobiographical memory, by testing whether and how the motor system contributes to autobiographical memory. In particular, I am using functional Magnetic Resonance Imaging and electromyography (EMG) to test whether autobiographical memory recall involves automatic reactivation of motor activity. We find preliminary EMG evidence suggesting that muscles are reactivated during memory recall, indicating that memories are "reembodied".

My future research will focus on the subjective dimension of autobiographical memory, and its links to the body. I will investigate whether the sense of reliving which characterizes autobiographical memory is linked to an increased viscera-brain coupling (heart and gut) and to more motor reactivation (at the muscle and brain levels). This would support the idea that self-related processes are supported by brain-body interactions. My research will investigate this question at different levels: from the brain (with electrophysiology) to the peripheral (muscle activity) and internal (cardiac, gastric activity) levels, but also looking into behavior, causality links (with TMS and muscle stimulation) and clinical alterations of these mechanisms (patients with motor or memory disorders). I also intend to study how these questions might apply to real-life situations.

**Resumen del Currículum Vitae:**

I did my university studies at the Ecole Normale Supérieure (ENS, Paris), in biology (Bachelor) and cognitive neuroscience (Master). I was interested in research and in the neuroscience of consciousness, so I did many internships to explore different facets of consciousness. I studied sleep in rodents in Brazil, attention and visual perception in two different labs in Paris, anesthesia and coma in Liège and self-consciousness in Los Angeles. I obtained 3 scholarships to fund my stays abroad.

I then did my PhD at the ENS, supervised by Dr C. Tallon-Baudry (2013-2017). This resulted in 3 first-authored peer-reviewed experimental papers with 326 citations, 1 review, 1 book chapter, 8 posters at international conferences (1 poster prize at the Association for the Scientific Study of Consciousness conference in Beijing), 10 talks (8 invited) in 6 countries and 1 general audience article. I also received a thesis prize from Paris Sciences Lettre University and ADELI foundation, and was considered one of the "100 Talents L'Oréal-UNESCO pour les Femmes et la Science", by a jury of the French Academy of Science.

During an 11-month transition post-doc (2018), I worked at the Institut du Cerveau et de la Moelle (Paris) with Drs N. George and A. Puce. This work resulted in an experimental paper in a top-level peer-reviewed journal, and a poster presentation at an international conference.

Having obtained a post-doc fellowship from the Fyssen Foundation, I moved to London for a post-doc at the Institute of Cognitive Neuroscience, University College London, with Prof P. Haggard (2019-2021). I received two research grants (UCL Higher Education and Innovation grant; British Academy small research grant) to conduct two science-society projects, involving museums, virtual reality experts, and architects. I was main PI on both grants, and fully managed both projects. This work led to one experimental paper in a top-level scientific journal, 1 poster and 3 talks, as well as different dissemination activities to the general audience, organized in the context of this collaboration.

Since 2021, I am a post-doc researcher at the Laboratory of Cognitive Neuroscience, Ecole Polytechnique Fédérale de Lausanne, led by Prof O. Blanke (Geneva). I am also responsible for the scientific meetings of the "Memory and Navigation" group, and I am the student manager in the lab, organizing recruitment, administrative work, scholarship applications and evaluations.

Throughout my career, I supervised 7 bachelor, 4 master (2 master thesis) and 2 PhD students, coming from 7 different institutions in Europe, Japan and US. I was invited to give talks in neuroscience labs, but also engineering, philosophy and architecture labs. I had teaching activities, for the Max Planck Institute (Berlin, 2020) and Indiana University (USA, 2022-2023) and I participated in the student seminar of the Functional Imaging Laboratory as an electrophysiology expert (London, 2019). I co-organized a large-scale scientific conference on consciousness in Paris (ASSC, 2015). I was part of Masters and PhD thesis committees, I was external evaluator for grants submitted to the French and Polish national science institutes and I regularly review scientific papers. I have also been engaged in dissemination activities, such as writing general audience articles or participating in science festivals.

**Área Temática:** Psicología
**Nombre:** GONZÁLEZ VILLAR, ALBERTO
**Referencia:** RYC2023-044827-I
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**Título:** Neural mechanisms of pain, affective touch, and their interaction in healthy and clinical populations

**Resumen de la Memoria:**

My main line of research -and subject of my PhD- has been the study of the self-reported cognitive problems in patients with fibromyalgia, mainly using electrophysiological techniques. Using novel and advanced methods of data analysis, we found that these patients show lower modulation of EEG indices related to bottom-up and top-down attention processes (lower posterior alpha and midfrontal theta power, reduced connectivity in theta band, and increased levels of neural noise). These works were among the first to demonstrate that cognitive dysfunction in these patients are not only subjective complaints, but there are specific neural markers that correlate and explain such deficits.

Another line of research carried out in parallel was dedicated to the study of motor inhibition. In several studies using the Stop-Signal task we demonstrated that neural correlates of inhibition appear during both real execution and mental rehearsal. These correlates also appear after infrequent signals that do not require inhibition. Using machine learning methods, we were able to classify between Stop and infrequent non-Stop signals, suggesting that these EEG markers can be used in brain-computer interfaces.

I dedicated a good of my PhD period to exploring new methods of data analysis and learning different programming languages. This gave me the opportunity to participate in numerous research projects with different research groups (mainly from Spain and Portugal) designing and programming numerous EEG and fMRI experiments. These collaborations are resulting in several outputs in the form of communications and publications

I started my postdoc in 2018 in the Universidade do Minho (UMinho) after receiving a fellowship from the Xunta de Galicia. Shortly after I have been awarded a 6-year contract in a highly competitive call from Portuguese national agency for science. Recently I was awarded with a contract for assistant researcher in the "FCT Individual Call to Scientific Employment" (best rated candidate on the psychology panel). During my postdoc I started a new line of research, the study of the interaction between interpersonal/affective touch and pain sensitization processes. Framed in this line of research, I have been awarded the prestigious EFIC-Grünenthal-Grant. I am also the PI of a project funded by the Portuguese national funding agency for science (Exploratory project with the highest score in the Psychology panel, 2021). In these projects we aim to characterize how the activation of cutaneous low-threshold mechanoreceptors can cause analgesia and mitigate processes of central sensitization of pain (phenomena that are related to the development and maintenance of chronic pain) using both neutral and naturalistic affective touch conditions Recently, my third project as PI has been funded by the Bial Foundation. In this project, we will use several electrophysiological indexes to clarify how affective touch modulates nociceptive/somatosensory input at different processing levels, from the spinal cord, through brainstem nuclei, up to cortical areas involved in top-down mechanisms. My future lines of research aim to evaluate how these hedonically antagonistic somatosensory modalities (affective touch and pain) may be altered in particularly susceptible clinical populations, such as chronic pain patients or people with autism spectrum disorder.

**Resumen del Currículum Vitae:**

I am a researcher in the Universidade do Minho (Portugal). I have dedicated the early stage of my scientific career to the study of cognitive alterations in patients with fibromyalgia, and exploring the neural basis of motor inhibition, mainly using behavioral data and applying advanced EEG analysis methods.

Currently I am the Principal Investigator of 3 funded research projects. One of them has been awarded by the prestigious EFIC-Grünental-Grant; the second one was founded by the Portuguese national agency for science (FCT), being the best rated project in the Psychology (Exploratory) panel; and the last one has been recently funded by the Bial Foundation. These 3 projects are focused on the line of research that I have initiated, in which we intend to know the mechanisms through which pain and affective touch interact, evaluating peripheral, spinal, and supraspinal electrophysiological biomarkers. Throughout my career I have secured funding for my research activities from several public entities, making a total of >400K €

I am an external advisor in an international Horizon European project that aims to reduce pain in cancer patients by using at-home non-invasive neuromodulation techniques, and how its efficacy can be predicted by biomarkers of central pain modulation.

I have published 29 papers, 8 of them as first author. My current H index is 13 and the total number of citations is 363 (according to Researcher ID from Web of Science).

I collaborate with an extensive network of scientists mainly from Portugal, UK, France and Spain. I have designed and programmed more than 30 tasks for its use with EEG, MRI or fNIRS for groups from different institutions in Spain, Portugal or France. The vast majority of software to execute these tasks was published in open access on my Github page (https://github.com/AlbertojacGon). I have also designed open-hardware devices that I am using in my recent studies to perform somatosensory stimulation in a controlled manner and study the related brain activity.

I am a team member of a startup in the pre-incubation phase, that will offer services of pain assessment, education and treatment services for clinical entities, pharmaceutical companies and patients. I was involved in an outreach project financed by the FECYT that aimed to awaken interest in neuroscience among high school students. I also have participated in other outreach activities for chronic pain patients.

I am currently leading my research group. Within this group, 3 students have recently received funding to do their PhDs under my direction. In addition, I am also co-directing 1 PhD student and have co-directed another one. Three master students have presented their dissertations under my supervision.

I have taught programming courses to PhD students of the Universidade do Minho and Universidade de Santiago de Compostela for several years. I have also taught Neuroscience classes to first year psychology students.

I have participated in numerous scientific congresses with posters presentations and two invited talks. I have acted as a reviewer in several journals (e.g. Journal of Affective Disorders, European Journal of Neuroscience, or Scientific Reports, among others). I am a Review Editor of Frontiers in Human Neuroscience. I also have acted as a reviewer of a project from a funding association (ME Research UK).

**Área Temática:**        **Psicología**
**Nombre:**               LOINAZ , ISMAEL
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**Título:**               Evaluación y gestión del riesgo de violencia

**Resumen de la Memoria:**

El candidato es licenciado y doctor en psicología y licenciado en criminología, Se especializó en psicología jurídica y forense con estancias formativas en la University of British Columbia -Canadá- y Unidad de Psicología Forense de la Universidad Santiago de Compostela. También se ha formado en talleres internacionales sobre evaluación del riesgo en la CATAP (Canadá, 2012) o una formación europea en la escuela de Policía de Roma (2015). Ha desarrollado su trayectoria de investigación inicialmente en materia de violencia de género (con especial atención a las tipologías de agresores de pareja). Posteriormente ha extendido sus líneas a la predicción del riesgo de distintos tipos violencia en (con creación y adaptación de herramientas para violencia de pareja, sexual, filio-parental y yihadismo), y evaluación y tratamiento de delincuentes (incluida la atención de mujeres presas).

Cuenta con 10 años de trayectoria postdoctoral como personal docente investigador en la Universidad de Barcelona, siendo miembro del Grupo de Estudios Avanzados en Violencia (GEAV), referente nacional y en Latinoamérica en materia de evaluación del riesgo de violencia y tratamiento de delincuentes, y el Violence, behaVior, Individual differences and Technology Studies group (WITS).

En estos años de investigador pre y postdoctoral ha colaborado con cuerpos policiales como la Ertzaintza (creación del sistema EPV-R en uso actual en el País Vasco) y el Ministerio del Interior de España (sistema VioGen, en uso actual en todo España excepto Cataluña y País Vasco) en la creación y adaptación de las herramientas para evaluar el riesgo de violencia de género y protección de las víctimas. También ha formado a profesionales de justicia y prisiones de Cataluña () y en Latinoamérica a la Gendarmería de Chile (2022), el Instituto Penitenciario de Perú (2019) o Medicina Legal de Colombia (2015).

Ha participado en el inicio de la creación de la herramienta para la predicción del riego de radicalismo yihadista en prisiones españolas (Instituciones Penitenciarias 2019) y recientemente en la revisión de la eficacia del programa para tratamiento de delincuentes violentos aplicado en prisiones de Cataluña (2022). Entre sus líneas de investigación actual están la violencia filio-parental (con la creación de la primera herramienta a nivel internacional para la predicción del riesgo de este tipo de violencia), la adaptación de la evaluación y tratamiento de mujeres delincuentes (con un especial foco de atención en la historia de victimización y el tratamiento centrado en el trauma), la evaluación del riesgo en contexto psiquiátrico (con atención a la relación salud mental y violencia) así como mejoras en el desarrollo de la evaluación del riesgo de violencia de género (con la revisión de protocolos y la ampliación de colectivos a proteger como los hijos en relaciones donde hay violencia). También trabaja en materia penitenciaria impulsando la evaluación del riesgo en violencia de género y sexual, así como la evaluación y tratamiento de mujeres delincuentes.

Actualmente desarrolla una estancia en la Universidad del País Vasco dentro del programa de Recualificación del Profesorado (fondos europeos NextGeneration).

**Resumen del Currículum Vitae:**

En la trayectoria del candidato destacan aportaciones de especial relevancia y contribución al conocimiento. Su línea predoctoral introdujo la temática de las tipologías de agresores de pareja en el terreno de habla hispana, estableciendo distintos subtipos de agresores que posteriormente han sido replicados en estudios y tesis docotorales en el contexto español y latinoamericano, así como describiendo datos de reincidencia con una herramienta nueva (B-SAFER) o la evaluación de los agresores con herramientas que aún no estaban disponibles (como las facetas de Grossman del PAI). En el contexto internacional, el autor ha presentado en los últimos años la primera y única herramienta existente hasta el momento para evaluar el riesgo de violencia filio-parental (la RVFP o CPVR en inglés), con 5 publicaciones en la materia (2023, 2022, 2020, 2020 y 2017) así como su presentación en España, Latinoamérica (México, Chile...) y contexto europeo (EATAP conference Rotterdam 2019, y AETAP newsletter summer 2020). También ha publicado el primer y único manual en español sobre evaluación del riesgo de violencia (Pirámide, 2017).

Entre sus aportaciones a la sociedad destaca la contribución del candidato a los sistemas de evaluación y gestión del riesgo de violencia de género en uso por la policía en España, participando en la creación de la herramienta propia del País Vasco (EPV-R, 2019-2013) así como en las revisiones de la herramienta estatal incluida en el sistema VIOGEN (VPR y sus derivados; VPR4.0 en 2019, VPR-H en 2021). Estos sistemas son de uso diario y permiten la mejor gestión disponible hasta el momento de las denuncias por violencia de género, protegiendo y evitando nuevas agresiones en cientos de miles de casos durante estos años. El autor también ha participado como IP en proyectos vinculados al riesgo de radicalismo yihadista en prisión (Ministerio de Interior, 2019) o la revisión del tratamiento de delincuentes violentos en prisión (Generalitat de Cataluña, 2022).

Entre las aportaciones a la formación de jóvenes investigadores destaca su participación en formación de máster desde 2014 (UPV/EHU, UB, UAB, UMH, U. Católica de Valencia, Otavalo-Ecuador, UDP-Chile, U. Andina Simón Bolivar-Bolivia, U. Santo Tomás-Colombia, U. Católica de Uruguay). Ha dirigido más de 30 TFMs en máster oficial (UMH y UB) y más de 90 en títulos propio (Máster en Psicología Forense y Criminal, IL3-UB. Participa anualmente como tribunal de TFMS desde 2014, y ha participado en 4 tribunales de tesis doctorales (Valencia-2014, Zaragoza-2014, UB-2016, Murcia-2017), dirigido una tesis doctoral (U. de Valencia-2017), participó en 2018 en la selección de candidatos para las ayudas predoctorales del Principado de Andorra, y fue comité de selección en la convocatoria de proyectos de investigación de la comisión nacional de investigación de Chile (CONICYT, 2012). También ha sido receptor de alumnos de movilidad, a destacar la investigadora predoctoral de la Universidad de Toronto (A. Ma de Sousa), y la investigadora postdoctoral L. Barboni de la Universidad Católica de Uruguay, a quienes se implicó en distintas líneas de investigación (Loinaz, Barboni & Ma de Sousa, 2020; Loinaz & Ma de Sousa, 2020; Loinaz, Bigas & Ma de Sousa, 2019).

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| **Área Temática:** | Psicología |
| **Nombre:** | GARCÍA SÁNCHEZ, EFRAÍN |
| **Referencia:** | RYC2023-044529-I |
| **Correo Electrónico:** | egarcias@ugr.es |
| **Título:** | The Psychology of Inequality and Welfare Public Policies |

**Resumen de la Memoria:**

My research and career lie at the intersection of psychology, sociology, and political science. I combine different research methods (quantitative and qualitative) and bridge academic and applied research. My training in psychology has received constant input from sociology and political science, such that my research have adopted a more structural perspective on the societal conditions that shape psychological processes, such as perceptions and beliefs about inequality. I also performed as a practitioner for four years, working on social intervention, research, and teaching at the National Police of Colombia. I was awarded one of the European scholarships (Erasmus Mundus) to conduct a master's degree in psychology of social Intervention (2012) in Spain, and later obtained another Master's degree in work and organizational psychology at the Universidad del Valle (2014). Subsequently, I earned a competitive scholarship from a National Agency from Colombia to pursue a doctoral degree abroad at the University of Granada (2014-2019).

Regarding my research contributions, I've published about 44 scientific manuscripts, including scientific paper, book chapters, and working papers. I've also published book chapters in international handbooks of social psychology; and have 6 manuscripts under review, apart from the ones in progress. I've also participated in the main international conferences in my field and actively participated in international research networks from Europe, the United States, and South America.

As for the leadership role, I've coordinated professional teams doing applied research in the field. During my postgraduate training, I've provided support to research student seminars and co-supervised undergraduate and postgraduate students. I've published (along with my Lab colleagues) some of the very first papers about perceptions and ideologies of economic inequality from a psychological perspective, including manuscripts in high-rank journals, but also in Spanish writing journals that target local scientific audiences. In sum, my research trajectory is still at an early stage and is undergoing a consolidation process, for which I'm actively engaged with international research networks conducting high-impact research.

I've attended summer schools in survey methodology and data analysis (structural equation modeling, longitudinal analyses, causal inference, and survey research), as well as seminars on open science and political psychology. I've also collaborated actively with researchers from more than 10 different countries, with whom I've published several scientific papers.

My research interests focus on two core areas. First, I am interested in understanding how people perceive, understand, and respond to economic inequality. Second, I seek to explain what drives people's policy preferences to deal with pressing social issues. This research agenda is aligned with the Sustainable Development Goals adopted by the United Nations, such as No. 10 Reducing inequality, and No. 16 Peace, Justice and strong institutions. Because psychological processes are behind political decisions that support public policies and political institutions, understanding how people make sense of their social reality and political environment is crucial for promoting support for more equal societies and strong institutions.

**Resumen del Currículum Vitae:**

I'm currently the Economic Mobility Fellow Postdoctoral Researcher at Stanford University (CA, USA). I have been a postdoctoral researcher in the Lab of Social Psychology of Inequality at the University of Granada, Spain (2021-2023) and at the Center for the Study of Violence at the University of Sao Paulo, Brazil (2019-2021).

I earned my doctoral degree in Social Psychology (University of Granada) in March, 2019. I also have two master's degrees, one in Psychology of Social Intervention (2012, University of Granada) and the other in Work and Organizational Psychology (2014, University of Valle, Colombia). I obtained my degree in Psychology (2007, University of Valle) and took a specialization training in co-existence, prevention, and security issues (2009, National Police Academy, Colombia).

I've worked both in research and applied fields of social psychology by leading social intervention programs, teaching, and researching on co-existence, prevention, and safety topics.

I'm also an invited lecturer for undergraduate and postgraduate courses at the University of Granada (Spain) and the University of Norte (Colombia).

My overall scientific contribution so far consists in 44 scientific manuscripts (updated to January, 31st, 2024), of which 35 are peer-reviewed papers, 8 book chapters, and 1 working paper. Regarding the scientific articles, 28 (out of 35) are indexed in JCR (11 in Q1; 6 in Q2; 4 in Q3; and 7 in Q4); and I am the leading or corresponding author in 17 manuscripts.

**Área Temática:** Psicología
**Nombre:** COSTA , MANUELA
**Referencia:** RYC2023-043536-I
**Correo Electrónico:** manuelacosta88@gmail.com
**Título:** Characterizing and modulating neural mechanisms associated to emotional memory

**Resumen de la Memoria:**

My career has been dedicated to exploring how the brain processes emotional information, covering various aspects such as perception, social judgments, and memory processes. Utilizing techniques like eye-tracking and electrophysiological methods, including scalp EEG, iEEG, and single-unit recordings, I've investigated both healthy and pathological behaviors. Initial contributions include uncovering the phylogenetic preservation trust embedded in facial emotional and morphological markers between monkeys and humans. This was achieved exploring eye movement strategies when exposed to different conditions of trust (trustworthy vs untrustworthy faces) and revealing the impact of static face characteristics on expressing trust preferences. The investigation of certain neuropsychiatric diseases, particularly Williams-Beuren Syndrome, has been essential in identifying impairments in implicit trustworthiness representation but preserved top-down mechanisms as part of the disease. This research line on clinical neuroscience has led me to investigate the face processing in patients with Williams-Beuren Syndrome and Autism Spectrum Disorder using high-intensity EEG recordings. Moreover, I conducted intracranial electrophysiology of the limbic system in drug-resistant epilepsy patients, with electrodes implanted in the amygdala and hippocampus. This unique opportunity provided important insights into amygdala-hippocampal communications during emotional memory processes. My research spans from basic neuroscience to clinical applications, resulting in significant publications, including papers in Nature Communications (two first author papers and corresponding and one under consideration), Cortex (first author) or Cell Reports (2nd author). International collaborations, including a visiting position in Los Angeles, has enhanced my international network and visibility to expand my research expertise. I aim to leverage these collaborations in my future lab to answer complex questions regarding brain function and dysfunction, continuing research on electrophysiology, neuromodulation techniques, and exploring emotional memory and interconnected processes such as forgiveness.

**Resumen del Currículum Vitae:**

I am an experienced senior researcher in Cognitive Neuroscience specializing in the interplay between emotional information and perception, social judgments, and memory processes. My research involves diverse methodologies, including behavioral measures, eye-tracking, EEG, intracranial EEG, and single-neuron data analysis. My expertise was built upon international collaborations including Cedars-Sinai-Caltech University (California, USA), CNRS (France), and University of Zurich (Switzerland). Currently, I'm senior postdoc funded by an ERC Consolidator grant (ending in 2024) and seek to embark on an independent research career through the Ramon y Cajal fellowship. My ongoing work explores the mechanisms of amygdala-hippocampus communication during emotional memory formation and retrieval, contributing to the understanding of how emotions modulate memory. My motivation to this matter has produced notable contributions in high-impact journals and presentations in prestigious conferences and universities worldwide. To this, I have established a broad international network, collaborating with experts across the USA, France, UK, Switzerland, and Spain. I was invited to prestigious institutions, including Imperial College University (UK), UCLA (USA), Utah University (USA), and CNRS (France); and conferences worldwide, such as Society for Neuroscience (SfN). I actively contribute to the global cognitive neuroscience community, with recognitions including receiving the IBRO travel grant and the Jose Castillejo grant for a visiting postdoc position in Los Angeles. I have demonstrated a leadership role by securing competitive fellowships and contributing to the execution of international projects. My impactful research secured competitive fellowships and funding, including PALSE (European PhD Scholarship), Ayudas a la transferencia-UAM, Madrid Community Post-doctoral Fellow, and the MINECO Jose Castillejo grant. I actively contribute to international projects, such as the ERC Consolidator grant. I supervised 12 students and fostering successful transitions to esteemed institutions like Imperial College London and MIT. As the most senior lab member, I provide guidance on data analysis and funding to other postdocs. I am committed to open science, publishing on preprint servers and in open-access journals (70%). Engaged in outreach, I actively promote the visibility of women in science, contributing to Science Week, winning contests (in youtube), and publishing books, including one with National Geographic. I communicate my research findings to diverse audiences, including patients and their families. Overall, my research has significantly contributed to understanding brain-behavior interactions in emotional processing, trust, and memory, bridging basic neuroscience with clinical applications. My multifaceted international engagement, positions me well for future collaborative endeavors in my independent research career and laboratory.

**Área Temática:** Psicología
**Nombre:** PACHECO ESTEFAN, DANIEL
**Referencia:** RYC2023-045254-I
**Correo Electrónico:** daniel.pacheco@upf.edu
**Título:** A mechanistic understanding of human memory "in the wild"

**Resumen de la Memoria:**

The overarching and coherent long-term goal of my research is to achieve a mechanistic understanding of the neural processes that support memory and spatial navigation under natural conditions in the human brain. I have pursued a coherent line of research in cognitive neuroscience to achieve this objective in the last 12 years, integrating advanced methodological approaches from the domains of Machine Learning (ML), Human computer Interaction (HCI), and neuroscience. I have implemented novel paradigms employing eXtended Reality (XR) technologies to investigate memory and navigation under natural conditions and in all their complexity. I have developed and applied methods from artificial intelligence and ML to scrutinize the representational contents, formats and dynamics of memory, its behavioral determinants and neurophysiological substrate. Throughout my career, I have recorded and analyzed data across all levels of brain organization, including single-unit and iEEG data in epilepsy patients and scalp EEG data combined with various physiological signals in healthy participants. I have employed multivariate statistical techniques including pattern classification, Representational Similarity Analysis (RSA) and deep learning (DL)-based analysis to decode the neural basis of specific experiences and track them across successive memory stages. Thus, my research uniquely integrates two important aspects that are only rarely pursued together: the mechanistic analysis of content-specific memory traces via DL-based methods, and the development of highly ecologically valid paradigms and approaches using advanced XR technologies. The unique combination of these exceptional methodologies allows me to address a fundamental scientific question: what are the neural mechanisms that support the formation, storage and retrieval of memories "in the wild"?

Throughout my career, I have published my research in some of the most prestigious and competitive journals, including Nature Communications, PNAS and Current Biology. In total, I have published 21 articles, which have been cited 277 times, resulting in an h-index of 10 (source: google scholar, 29/01/24). I formed a worldwide network of collaborators, including world renowned researchers at the universities of Stanford, Lausanne (EPFL), Beijing Normal University (BNU), University of Barcelona (UB), and Polytechnic University of Madrid (UPM). I regularly teach neuroscience and VR courses to master and bachelor students at the Pompeu Fabra University (UPF), Barcelona, Ruhr University Bochum (RUB), and BNU. I have supervised and evaluated numerous bachelor, master and Ph.D. theses at the UPF, RUB, UB, and BNU, and was invited to present my research at various prestigious national and international conferences. As a Ramón y Cajal researcher, I will develop a pioneering and interdisciplinary research program at the intersection of XR, ML and neuroscience, to investigate the neural basis of human memory in naturalistic scenarios.

**Resumen del Currículum Vitae:**

I obtained two official Master degrees at the Information and Communications Technology Department (DTIC), Universitat Pompeu Fabra (UPF, Barcelona, Spain), in Computer Graphics and Animation (MUAN, 2009) and Cognitive Systems and Interactive Media (CSIM, 2011), before starting my PhD at the Synthetic, Perceptive, Emotive and Cognitive Systems laboratory (SPECS, DTIC, UPF), with prof. Paul Verschure (Defense date: 15/12/2017). After my Ph.D., I conducted two postdoctoral training periods at the Institute of Bioengineering of Catalonia (IBEC, Barcelona, Spain), and the Neurophysiology group, Institute for Cognitive Neuroscience, Ruhr University Bochum (RUB; Bochum, Germany, with Prof. Nikolai Axmacher).

In my research, I develop and apply advanced methods from machine learning and artificial intelligence in order to identify the neural representations that support memory and navigation processes in the human brain (Pacheco Estefan et al., PNAS, 2021; Pacheco Estefan at al., bioRxiv, 2023). I conceptualize and deploy innovative Virtual Reality (VR) systems to investigate memory in naturalistic conditions involving volitionally controlled behavior, spatial navigation and embodied interaction with the environment (Pacheco Estefan et al., Front. Behav. Neurosci., 2017; Pacheco Estefan & Verschure, Memory, 2018; Pacheco Estefan et al., Nat. Commun., 2019). I analyze complex types of data in cognitive neuroscience including single-unit and intracranial EEG recordings in epilepsy patients, scalp EEG and other physiological signals (eye-tracking, heart rate, electrodermal activity; Pacheco Estefan et al., Front. Behav. Neurosci, 2014; Pacheco Estefan et al., PNAS, 2021; Pacheco Estefan et al., Nat. Commun., 2019). Thus, my research uniquely integrates the mechanistic analysis of content-specific memory traces via DL-based methods, and the development of highly ecologically valid paradigms and approaches using advanced VR systems.

Throughout my career, I published 21 articles in journals and peer-reviewed conference proceedings, including several first-author publications the most prestigious journals such as Nature Communications, PNAS, and Current Biology. I formed a worldwide network of collaborators in prestigious universities around the world and was invited to present my research at various international conferences. I regularly teach neuroscience and VR courses to master and bachelor students at the UPF and RUB.

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

**Área Temática:** Psicología
**Nombre:** LELONKIEWICZ , JAROSLAW
**Referencia:** RYC2023-043585-I
**Correo Electrónico:** jlelonki@gmail.com
**Título:** The cognitive, the social, and the context: Towards a comprehensive, ecologically-valid theory of conversational alignment

**Resumen de la Memoria:**

When in conversation, people align on different aspects of language. But why? The answer remains unknown: Although several theoretical accounts have been proposed, none of them can accommodate for the totality of evidence for alignment. In addition, many accounts are based on constrained experimental paradigms, and so it is unclear whether they can be applied to the alignment that occurs in natural conversations. To make progress, this research program draws on a unique combination of methods – through careful experimentation it first identifies the causal mechanisms of alignment; next, it employs observational methods to verify whether these mechanisms generalize to natural conversations. In doing so, it lays a foundation for an overarching, ecologically-valid theory of conversational alignment and advances our knowledge of language production and comprehension.

**Resumen del Currículum Vitae:**

I am a cognitive psychologist specialized in language, memory, and learning; I am hard-working, highly skilled, and passionate about science and the benefits it brings to society. Since the completion of my undergraduate studies in Poland, I have received a PhD from The University of Edinburgh, worked in top institutions in the UK, Italy and Mexico, and collaborated with others around the world. Currently, I am a Marie Sklodowska-Curie Postdoctoral Fellow at the Pompeu Fabra University.

My career has been characterised by research excellence, independence, and high leadership potential. I have a strong track record involving publications in high-impact international journals and conferences. Most of my publications are fist-author, meaning I played a lead role in conceptualising, conducting, and disseminating research. Many of my papers have been accepted by excellent outlets, testifying to their theoretical importance. Moreover, my original research has attracted funding from academic and non-academic competitive calls.

My science meets the highest standards of rigor and transparency – I pre-register my studies, share data, methods, and manuscripts via the Open Science Framework. I actively participate in meta-scientific, many-labs replication efforts and in innovative research organisations working to improve the internationalisation and methodological standards in science. Over the years, I have developed a rich portfolio of research skills which includes: scientific programming, machine learning, advanced statistical analysis, research with adults, children, clinical populations, animals, various experimental methods, as well as excellent written and spoken communication and an ability to speak about science in clear, understandable terms.

I have demonstrated an ability to run entire research lines with no supervision from senior colleagues. On the other hand, I have also successfully participated in numerous scientific collaborations, some of which involved multiple research centres. Throughout my career, I have built up considerable experience working with both junior and senior colleagues and in teaching - I have trained about 20 young researchers, introducing them to experimental methods, acting as their mentor, and, in one case, co-supervising an MSc thesis; I worked as a lecturer and teaching assistant. Last but not least, I continue to serve the scientific community as a reviewer and conference organiser and participate in knowledge transfer initiatives, educating about science and engaging the non-academic public in the process of making new discoveries. I am now at the point in my career where I could move onto the position of a research leader, capable of pursuing my original ideas in the long-term horizon. The stability offered by the ' Ramón y Cajal' call would allow me to reach this goal.

**Área Temática:** Psicología
**Nombre:** ORTIZ  TUDELA, FRANCISCO JAVIER
**Referencia:** RYC2023-045452-I
**Correo Electrónico:** fjavierot@gmail.com
**Título:** Cognition at the intersection between fields, domains and techniques

**Resumen de la Memoria:**

The core idea of my research career has been exploring the intersection of cognitive processes. From relatively simpler processing of visual information to complex decision-making, the relationships among processes remain largely unknown Pursuing this question has made me reach out and get to know experts in many different fields.

It is following this question that I conducted my PhD exploring the impact that applying cognitive control has on memory formation. The work derived from this line of research rendered three publications in highly-ranked peer-reviewed journals and served as a basis for 3 bachelor theses and one master thesis.

Towards the end of my PhD, I learned about Predictive Processing accounts of brain functioning which immediately seemed like a perfect framework to investigate the relationship between cognitive operations. With this idea in mind, I obtained my postdoctoral position at the Goethe University of Frankfurt (Germany) to work on an ERC-funded project with Prof. Yee Lee Shing. During my postdoctoral work, I explored the relationship between predictive processing and memory. This relation is bidirectional. First, memory serves as the source for prediction generation. This feature of higher order mnemonic representations had not been explored before. Second, the mere act of predicting bias the type of information that is encoded into memory thereby changing our internal models and, eventually, improving future predictions. This dual relationship has been explored in two papers published in top-ranked journals (Neuroimage and Journal of Experimental Psychology: General) and several communications to international conferences (e.g., SfN, CNS). On top of this, the first part of the project investigated the layer profile of prediction signals in the brain with ultra-high field scanning.  I was an invited researcher to the Center for Cognitive Neuroimaging (Glasgow, Scotland) for 7 months where I learn to operate the scanner and analyse high-resolution fMRI data with Prof. Lars Muckli. This still-ongoing collaboration has been extended to include Prof. Christian Doeller at the Max-Plank Institute for Brain Sciences (Leipzig, Germany).

My latest project as well as most of my previous work is placed at the intersection of several disciplines. I aim at following the flow of information from its entry point into our brain until its eventual remembering by exploring all the intermediate operations in between. I will be using several techniques which I acquired over the years such as fMRI, brain stimulation and analysis of eye tracking together with the use of Artificial Intelligence agents. In addition, a novel analytical approach known as CNA will be used to establish causal relationships between factors.

**Resumen del Currículum Vitae:**

I got my PhD at the UGR in 2018 with Prof. Juan Lupiáñez and Prof. Luis Jiménez. My research career has been shaped by learning, great international mobility, and constant collaboration across institutions and fields. Evidence of this is the 3 international research stays during my PhD, the close collaborations with leading institutions, and the scientific production stemming from my work. In addition to being the first and corresponding author of the 4 articles within my pre-doctoral work, these collaborations have allowed me to be the corresponding author on 2 articles where I am not the first author and to recently publish my first article as a senior researcher.

From 2018 to 2023, I worked as a postdoctoral researcher at Goethe University of Frankfurt with Prof. Yee Lee Shing, funded by an ERC grant. Under this umbrella, I have published 5 research papers in top peer-reviewed journals. During my postdoctoral period, I initiated national and international projects with prestigious centres such as the Imaging Center of Excellence (Glasgow, UK), the Max Plank for Empirical Aesthetics (Frankfurt, Germany), and the Max Plank for Brain Science (Leipzig, Germany). These collaborations have already resulted in a first-author publication in a high-impact journal (Neuroimage), 5 contributions to international conferences and 3 more scientific articles currently at different stages of development.

I have actively participated in outreach activities with 3 science dissemination articles published in a peer-reviewed journal which aim to translate my latest research to the general public. I have also contributed to the community with tools and knowledge. Poof of this is my active profiles on platforms for sharing code (https://github.com/ortiztud and https://gitlab.com/ortiztud). My desire to give back to society has led me to engage in voluntary teaching activities in Spain and abroad. These have always been within the framework of knowledge and skills transfer through programming workshops, the use of statistical methods and data management.

The pursuit of interdisciplinarity has been an important goal: from my thesis on the intersection of attention and memory to the organization of 3 interdisciplinary conferences, and the awarded fellowship at the Johanna Quandt Academy for interdisciplinary exchange. Thanks to this I have been appointed a member of the International Editorial Board for the Academy' s Book for 2022 and I am also contributing 2 book chapters.

Another constant in my career has been the strive to promote Open Science. During my PhD, I was one of the first to raise awareness and facilitate open science practices through the use of a priori power analysis, the registration of prior hypotheses before data collection, and the use of open-source software. Proof of this is the 22 projects and over 1,700 activities in my profile on the Open Science Framework (osf.io/5rpmj; member since 2015) and the public pre-registration of all experiments since 2015. In addition, I participated in a multi-lab Register Replication Report in 2020.

I was recently awarded a Project of Excellence for independent researchers from the Junta de Andalucía in 2022 with my proposal included in the top 5 and scored 98/100 points. This new project combines the various techniques acquired through my careers such as fMRI, eye tracking and artificial intelligence. Finally, I was scored 84.1/100 in the Ramon y Cajal 2022 call.

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| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
| **Nombre:** | OROSA NOGUEIRA, LOIS |
| **Referencia:** | RYC2023-045785-I |
| **Correo Electrónico:** | lorosa@cesga.es |
| **Título:** | More Capable, Secure and Efficient DRAM Main Memory Designs and Computer Architectures |

**Resumen de la Memoria:**

Lois Orosa has a large research experience in Computer Architecture, specially on hardware security and reliability issues, high performance architectures, Neural Networks accelerators, Storage Systems, and Processing in Memory Systems. At the time of presenting this application, Lois Orosa has 1414 citations (Google Scholar). Lois Orosa obtained the R3 certificate with a qualification of 38/40 in the Scientific and Technical Contributions Section (global: 96/100).

He has made 26 VERY relevant publications (according to the standard defined by ANECA) in the area of Computer Architecture, which are more than the number of very relevant publications required to get the highest academic grade in Spain (i.e., "Catedrático A"). He has received 19 HiPEAC paper Awards, which are given to researchers in Europe that publish their work at conferences in which Europe is not strongly represented. Lois Orosa has a large list of international collaborators that are top researchers in their area.

He made very relevant publications in secure DRAM memories. Lois and his collaborators have revisited in 2020 a hardware DRAM attack called RowHammer that was discovered in 2014. Far from being solved, the paper shows that the vulnerability is getting worse with newer generations of DRAM memory. He proposed other methods that go deep into the characterization of this attack to show new observations and insights, propose a new attack, and developed low cost mitigation mechanisms. His contributions had inspired the new DDR5 DRAM standard to adopt measures to mitigate this security issue. Lois has also proposed a reconfigurable DRAM architecture that can implement several security features, and proposed a new high throughput random number generator (RNG) in DRAM without making any changes to the original memory architecture. He also contributed very significantly in the area of Procesing in Memory (PIM) [R7][R10], hardware accelerators for Machine Learning [R8], high performance DRAM main memory systems [R4], among other topics (please see Lois Orosa's profile in Google Scholar).

The main research line to be developed during the next 5 years can be summarized as follows:

- Reliability and Security on Computer Systems: 1) characterization of errors in DRAM and Computer systems, and 2) propose new mitigation mechanisms to the existing vulnerabilities and security issues (e.g., RowHammer).

- New computer architectures and specialized accelerators to reduce energy consumption and increase performance: 1) domain specific accelerators (e.g., machine learning accelerators) that perform specific tasks with high performance and low energy consumption, and 2) new architectures that are more data centric (e.g., Processing in Memory Architectures) for saving energy and increasing performance by processing data close to where it is stored.

- Experimental Error Characterization in Quantum Computers, and study of their security implications: 1) we will perform a rigorous characterization study of different quantum computing technologies, with the goal of obtaining useful insights into how to deal with these errors, and propose mechanisms to mitigate these errors, and 2) in a scenario where multiple programs are running in a single QPU, we will analyze the interference between programs and the security implications of these interactions.

**Resumen del Currículum Vitae:**

Lois Orosa defended his PhD. in the University of Santiago de Compostela in 2013. He received the distinction of "Cum Laude" for the quality of his PhD thesis, and he has been doing research on Computer Architecture since then.

Lois Orosa is currently the Director of the Galicia Supercomputing Center (CESGA) since March 2022, which currently has 47 people. As part of the responsibilities assumed at CESGA, Lois Orosa is leading the Galicia Quantum Technology Hub (or "Polo de Tecnoloxías Cuánticas de Galicia"). The Hub strategy plan foresees an investment of 154M euros until 2030, from which around 30M were already executed.

Before joining CESGA, he was doing research at ETH Zürich for 4 years, in one of the more impactful and prolific Computer Architecture Research groups in the world, lead by Onur Mutlu. Before that, he received a research grant to work on Computer Architecture for 3 years in the University of Campinas, one of the best Universities in Latin America, where he co-advise a PhD student.

He also has been doing other research stays on top International Institutions, both in Industry, in the companies IBM R&D (Haifa, Israel), Xilinx (Dublin, Ireland), Recore Systems (Enschede, Netherlands), and Academia, in Universidade de Illinois en Urbana-Champaign (USA), Universidade Nova de Lisboa (Portugal).

He has contributed very significantly to the field of Computer Architecture in the last few years, making very relevant contributions especially in reliability and security of computer systems. He published in the 4 top venues in this area in the last few years: 4 papers in ISCA, 5 papers in HPCA, 7 papers in MICRO, and 3 papers in ASPLOS, from which he received 19 HiPEAC awards, given to European researchers that publish in strong venues. He also published 7 additional papers on top venues and journals (Q1 equivalent). The impact of these publications is significant in recent years, as demonstrated by the 459 citations in the year 2023 (1414 citations in total). Note that, unlike most other research areas, the proceedings of top

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Computer Architecture Conferences have more impact than journals.  He also has presented several posters and short papers, and has given multiple talks about his research. He serviced the community by being a reviewer and a program committee member of many conferences, journals and workshops.

You can find a detailed CV here: https://loisorosa.github.io/files/LoisCV.pdf

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
| **Nombre:** | GUTIÉRREZ SÁNCHEZ, JESÚS |
| **Referencia:** | RYC2023-045170-I |
| **Correo Electrónico:** | jesus.gutierrez@upm.es |
| **Título:** | User experiences with multimedia and immersive technologies |

**Resumen de la Memoria:**

My main research activities are related to the study of user experiences with multimedia technologies, which requires a multidisciplinary approach considering both technical factors (image/video/signal processing, data analysis, modelling, etc.) and perceptual aspects (visual perception, human behavior, etc.).

My PhD research work, carried out at the Grupo de Tratamiento de Imágenes of the Universidad Politécnica de Madrid (UPM), dealt with the assessment of the Quality of Experience (QoE) of 3D video systems, providing novel subjective testing methodologies, and holistically analyzing the impact of the whole processing chain (from capture to display), in comparison with other related works dealing with individual elements of the chain. During this period, I did two research visits of 3 months to Université de Nantes (UdN) and TU Berlin. As a result of this work, I received the Extraordinary Doctoral Award (UPM). Among the publications to international conferences and journals, one of the main outcomes was the release of an open-access dataset of 3D videos, which has been widely used by the research community in the field. In addition, I participated in 10 research projects working on the evaluation and modeling of the QoE of the users of 2D and 3D video systems. Also, I was involved in the worldwide tests to evaluate the quality of the encoding proposals for the 3DV MPEG standard and in subjective tests performed within the 3DTV project of Video Quality Experts Group (VQEG).

After my PhD I joined the Université de Nantes as a Marie-Curie postdoctoral researcher within the ITN PROVISION, which allowed me to expand my research to emerging immersive technologies (360º content, virtual/augmented reality, etc.). Then, I obtained a Marie-Curie Co-Fund fellowship, which allowed me to continue the research on QoE with immersive technologies and extend it with the use of psychophysiological measures to consider the behavior of the users. This work led to the publication of useful datasets following the commitment to open and reproducible research. During this period, I improved my track record with relevant publications and the involvement in the organization of scientific evens. Among them, I co-organized 3 Grand Challenges: "Video Compression Technology" (ICME'17, sponsored by Netflix), "Salient360: Visual attention modeling for 360° content" (ICME'18, sponsored by Facebook), and "Saliency4ASD: Visual attention modeling for Autism Spectrum Disorder" (ICME'19, sponsored by Dell). Also, I started chairing the Immersive Media Group of VQEG and I have been involved in various international scientific and standardization communities.

In 2020, I joined UPM with a Juan de la Cierva-Incorporación fellowship and from 03/2022 I'm Assistant Professor. On one side, I'm continuing the research on quality of user experience of immersive media. In this sense, I'm one of the two coordinators of the international cross-lab VQEG tests to study the QoE of 360º videos and immersive communications (which has been instrumental in the development of the ITU-T Rec. P.919 and the ITU-T P.IXC). On the other side, motivated by my previous works on visual attention for autism, I'm extending my research towards the study of user experiences and the use of multimedia technologies and machine learning for societal and healthcare challenges related to the SDGs.

**Resumen del Currículum Vitae:**

EDUCATION
-2016- PhD in Communications Technologies and Systems, UPM, Spain. Cum Laude. Extraordinary Doctoral Award
-2011- MSc in Communications Technologies and Systems, UPM, Spain
-2008- Telecommunication Engineering, UPV, Spain

PUBLICATION TRACK RECORD
-Co-author of 14 papers in international journals, 2 book chapters, and 31 papers in international peer-reviewed conferences
-Publication of 7 datasets and 3 toolboxes in open access
-h-index: 15 (GoogleScholar), 13 (Scopus)
-Total citations: 1289 (GoogleScholar), 824 (Scopus)
-Average citations (last 5 years): 183.6 (GoogleScholar), 119.2 (Scopus)

PROJECTS AND GRANTS
-Participation in 19 research projects (European, National and Regional) and 8 contracts, (co-)PI of 3.
-Juan de la Cierva-Incorporación fellowship at UPM. 02/2020-03/2022.
-Marie-Curie postdoc fellowship PRESTIGE (Co-fund). Université de Nantes (UdN). 09/2017-08/2019
-Marie-Curie postdoc fellow within the ITN PROVISION at UdN. 08/2016-08/2017

SERVICES TO THE SCIENTIFIC COMMUNITY
-Chair of the Immersive Media Group of the Video Quality Experts Group (VQEG)
-Member of the Technical Area Committee on Visual Image Processing of EURASIP
-Director of the Int. Summer School on eXtended Reality Technology and eXperience (Madrid, 2023)
-Co-chair of the Qualinet Task Force "Joint Qualinet-VQEG team on Immersive Media"
-General chair of ACM IMX'22 and MMVE'23
-Demo co-chair of the ACM IMX'20, Proceedings co-chair of MMVE 2019, Special Session co-chair of QoMEX'23 and ISPA'23, and Doctoral Consortium co-chair of IMX'23, Workshop co-chair of IMX'24
-Co-organizer of one Workshop at ACM CSCW'23, 4 special sessions at MMSP'23, IEEE ICIP'22, IEEE VCIP'20, IEEE 3DTV Con-2016, and 3 Grand Challenges at IEEE ICIP'17 and at IEEE ICME 2018 and 2019

-Editor of the journal Quality and User Experience (Springer), review editor of the journal Frontiers in Signal Processing, and guest editor of 3 Special Issues/topics on the journals Signal Processing Image Comm. (2021), Frontiers in Signal Processing (2023), and Frontiers in VR (2024)
-Member of TPCs of relevant international conferences and reviewer of top international journals and conferences. ICIP'20 Top Reviewer Recognition

CONTRIBUTIONS TO STANDARDIZATION ORGANIZATIONS AND SCIENTIFIC GROUPS
-Co-author of the "QUALINET White Paper on Definitions of Immersive Media Experience (IMEx)", 11/2020
-Co-author of several contributions to VQEG, MPEG, ITU-T, IEEE HFVE (P.3331), etc.
-Co-editor of the VQEG eLetter 11/2017 and co-author of one article

TALKS AND COMMUNICATION ACTIVITIES
-Invited talks/seminars at: CWI Spring School on Social XR (Amsterdam, 2023 and 2024), MPEG Workshop on Quality of Immersive Media (10/2021), GdR ISIS (CNRS) meeting at INSA Rennes (France, 03/2019), IETR (France, 07/2018)
-Editor of the ACM SIGMM Records. Co-author of periodic articles
-Participation in several outreach activities in France and Spain

TEACHING AND SUPERVISION
-Classes in bachelor and master courses of Telecomm. Eng. at UPM (2015/16, 2019-2024) and of the master "Visual Computing" of UdN (2017-2019)
-Co-supervisor of 2 PhD students (2023-), a Final Master Thesis at UdN (2018), and 7 Final Degree theses and 6 Final Master Theses at UPM (2021-2024)

CAREER MOBILITY
-Postdoc researcher at UdN, France. 08/2016-08/2019
-Visiting PhD. Student at TU Berlin (Germany, 09/2012-12/2012) and UdN (France, 06/2011-09/2011)

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | GIMÉNEZ GÓMEZ, PABLO ANTONIO |
| **Referencia:** | RYC2023-045335-I |
| **Correo Electrónico:** | pablo.gimenezgomez@gmail.com |
| **Título:** | Next generation of green sensing systems for sustainable precise analysis |

**Resumen de la Memoria:**

My multidisciplinary research along +15 years has enabled me to gain high competences in materials science, sensors, miniaturization, microfluidics and sensing integration. It has resulted in the development of numerous microanalytical devices applied to e.g., environmental control, clinical diagnostics, food/beverage control or cell culturing. The number of collaborators that I have being creating during this time in the Academia, business, health, environmental and social sectors have allowed me to transference my research to real scenarios and to demonstrate the real impact of my research findings in a translational and international scenario. I have successfully contributed to more than 17 national/European R&D projects and Innovation contracts (+1.5M €, +600k € as PI). I have authored 32 scientific publications (20 Q1; 17 first author; 8 CA), I have supervised a total of 3 bachelor students and 2 Erasmus students, 5 bachelor and 2 master thesis, and 1 PhD student during all this time. I have participated as mentor, supervisor and volunteer of many outreach and social-oriented activities in sciences. My aim is to continue working on filling the gap between the laboratory research and the society by developing robust and low-cost portable platforms capable of working under real conditions combining materials sciences and microfluidics. My research program includes: (1) Design and production of sustainable electrochemical and optical sensing transducers: use of suitable bio-materials naturally produced by silkworms for bio-electrodes production, doped with ILs and nanoparticles to produce gels with high conductivity, broad electrochemical window, transparency and non-solvent volatility and an insignificant environmental impact. They will substitute current electrode-based sensors using glass, plastic, metallic and/or silicon materials. (2) Development of functionalization bio-membranes for the modification of sensing transducers: development of novel high sensitivity opto-electrochemical biosensors that to be integrated into the silk-based bio-electrodes, providing precise analysis with high sensitivities in short response time. The bio-recognition reagents will be incorporated in the silk membranes, obtaining reagent-less biosensors for multiplexed analysis and colorimetric response. The use of silk will confer a greater temporal stability to the bioreceptor, maintaining the activity for several months without storage requirements, resulting in a ground-breaking sensing approach with a great impact for in-field analysis. (3) Integration technologies combining sensors and microfluidics for producing microanalytical systems: development of a pioneering approach integrating the bio-based sensors into cellulose substrates, which will offer many advantages for decentralized analysis, because liquids wick by capillary force, resulting in truly easy to use portable devices for on-site measurements, solving the limitation of current systems. After use, the entire system can be incinerated with relatively minimal environmental impact. (4) Application of the microanalytical systems for analysis with a high potential of transference: These paper-silk-based approaches are unique and minimalistic, breaking the classic paradigm of analysis, and resulting in an unprecedented strategy for an easy and decentralized analytical control.

**Resumen del Currículum Vitae:**

I have +15 years of experience from research institutions in Spain and Europe, including +6 years as a postdoc. I have a strong background in optical and electrochemical transduction, micro/nanotechnology, biosensing and microfluidics within the framework of 8 national and 2 European (as PI) R&D projects, and 6 R&D and innovation contracts with companies in Europe and USA. My competencies include: (i) manufacture of (electro)chemical sensors; (ii) Biofunctionalization with e.g. polymers, silk fibroin or nanomaterials; (iii) (electro)chemical and optical (bio)sensing; (iv) Microfluidics fabrication; (v) Integration technology combining sensors and microfluidics; (vi) Application of the microanalytical systems in e.g. the food/beverage industry, environmental control or clinical diagnostics; (vii) Writing/managing R&D/innovation projects; and (vii) Technology Transfer. I am author of 32 publications, including 22 articles in international high-impact peer-review journals (21 Q1; 14 first author; 8 CA); 8 conference papers; and 33 works presented at scientific conferences (21 oral, 1 invited). My (inter)national collaborations with researchers in fields as medical sensing, water control, analytical chemistry or materials have resulted in a number of integrated miniaturized analytical devices. I have gained 4 postdoc grants (MSCA IF from Horizon Europe; from the CTS Foundation in Sweden; Torres Quevedo from the Ministry of Science and Innovation in Spain declined to accept the CTS grant; Tecniospring INDUSTRY co-financed by the EU's H2020 MS-C actions). I have been/am the PI of 2 EU projects (€430,000), demonstrating my competence in the management of R&D/innovation projects. I have interest in technology transfer (6 R&D contracts with companies). I am the scientific advisor (I was the research leader the 1st year of the SME) of Happy Innova SL, funded thanks to the European project that I led (The Smart Lollipop). This project has received several transfer awards organized by e.g., UNICEF (2021), i4KIDS (2021) or InsudPharma (2023), and it has also closed a first round of 320,000 € for private investment. In the SME, I have led the development of a medical device (licensed EU patent), collaborating with clinicians, consultants and engineers to produce a final prototype. I have supervised 3 master's students, 9 bachelor's students and 1 PhD student, and mentored young researchers in programs organized by CSIC in Spain and ACES in Sweden. I have been part of the evaluation committee of 2 PhD dissertations. I have co-organize 2 international conferences (IBERSENSOR 2018 and TMSB 2018; with +80 and +50 participants respectively), and the Swedish Microfluidics Network 2023 (+50 participants), showing my capacity and inclination for networking. I have performed a number of dissemination activities, e.g. EscoLab, IMB-CNM Open days, Zoom High School, Summer School for second-year high school students or Science is Wonderful initiatives from the Barcelona Council, CSIC, Sweden's National Platform for Chemistry Teachers, Stockholm University and the EU, respectively, of activities that allow high school students to gain passion and/or first-hand experience in sciences. I am a peer reviewer and/or guest editor for various scientific journals (e.g., Food Chemistry; Biosensors; TrAC; Electrochimica Chimica Acta), and expert evaluator of EU proposals.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | TRILLES  OLIVER, SERGIO |
| **Referencia:** | RYC2023-042469-I |
| **Correo Electrónico:** | al088677@alumail.uji.es |
| **Título:** | Internet of Things & Geospatial data analysis & Computational Thinking |

**Resumen de la Memoria:**

After completing a BSc in computer engineering in 2010, I received a 1-year scholarship for initiation in research. My 2 master's theses were contributions to a European project (Eurogeoss [FP7]). In April 2012, I started my doctorate through a predoctoral scholarship from the Generalitat Valenciana (GVA) for 3 years. I completed my PhD in 2015 with the Summa cum laude grade and international distinction (I undertook a stay at the Joint Research Centre [JRC]/European Commission in Italy). SEnviro has been one of the most relevant results of my doctoral thesis. It has allowed to create a new line within the Geotec group (Own Research Line [ORL] 1) and certifying my independence supervisors. I participated in European projects, such as ERMES (FP7) and Enable (Erasmus+). After my doctorate, I was taken on by the Geo-c project (Marie Curie ITN). I played a postdoc role in charge of 5 Early Stage Researchers (ESR) of different nationalities. This opportunity made me gain a great deal of experience mentoring PhD students and organising scientific events. In 2016, I got a GVA postdoc fellowship for 2 years (compatible with my role in Geo-c). During part of this fellowship, I undertook a research stay at the I3A institute (Zaragoza University). In 2018 I started a stay at the Nova Lisboa University by the GVA. This stay was the starting point for a new research line (ORL2). I started 2 international networks (FabSpace 2.0/IDEAIS). At the end of 2018 I got an industrial postdoc (GVA) to join a company. In 2019 I obtained my second research postdoc financed by the UJI. In 2019, I obtained a PhD student by UJI grants for 3 years. Furthermore, I got a Juan de la Cierva - Incorporación fellowship. This situation allowed me to write ambitious proposals as PI (I got a " Generación del conocimiento - tipo A" project from the Ministerio de Ciencia). The A-wear project (ITN) started this year, and I supervised an ESR. I started a stay at the Rovira i Virgili University. This stay allowed the creation of a continuous link between groups, an example was a funded joint proposal (CovMovTur, I acted as PI at UJI). A new stay at the JRC was done in 2021. During this stay I wrote an ERC STG Grant proposal. In 2022, I undertook a new stay at Nova Lisboa. The same year, I started supervising 2 new PhD students.

I am a solid independent researcher, internationally recognised for my work on the IoT, interoperability and analysis of geospatial information. I have obtained my own funding for my contracts. Altogether, with all the pre/postdoctoral grants, a total of €448,188 has been raised. This flexibility has allowed me to create my own research lines, which did not exist in my research group. All of them were funded by 9 competitive projects where I am the PI managing €242,719, and I have my own staff for carrying them out. The research lines are: 1) Internet of Things (ORL1): designing and developing devices to provide monitoring solutions; 2) Analysing data (ORL2) using statistics and data science models; and 3) Engaging young people in computational thinking and programming (ORL3) concepts. I participated in group research topics (indoor location) and technology transfer projects. I am interested in open science and reproducibility techniques. I try to make a social impact by disseminating science, and especially my participation at events to foster STEM.

**Resumen del Currículum Vitae:**

I hold accreditation for the R3 certification (call 2023). I published 49 articles in leading journals such as IEEE IoT Journal, Future Generat. Computer Systems or IEEE Sensors (17 in Q1 [4 in Top 10%]; 21 in Q2), 38 articles at internat. congresses and 8 book chapters (Springer) and 8 European project reports. All my publications are gold/green open access. I published 4 data papers to follow computational reproducibility techniques. I have a balanced track record of first author publications (38) and 59 as a corresp. author. I established myself as an independent researcher, with 55 articles without my PhD supervisors. My research attracts remarkable international attention (G. Scholar: 1.949 citations, h-index:21; Research Gate Score (RIS): 1122; my RIS is higher than 97% of members who first published in 2011). I review more than 25 articles for high impact journals and conferences every year. I have been the editor of 3 special issues. I participated in 18 technical program committees, in a local committee 17th AGILE and a workshop at GISmart 2018. I have been invited to the OGC ILAF Intern. confer. as a guest speaker (2019). I participated as a panellist on expert committees from the Spanish and Polish research agencies. All the pre/postdoctoral grants were through competitive calls (a total of €448,188). I am accredited as Titular de Universidad and have 2 " senexios"  (2011-16 and 2017-22) both by ANECA. I taught 20 different courses in official bachelor/master' s degrees at 3 universities (310 ECTS) with outstanding evaluations.

I am the Principal Investigator (PI) in 9 projects, managing €242,719. These are: 1) Sucre4Kids, UJI, €19,944; 2) Trust4IoE, Ministry of Science, €35,937; 3) Covmovtur, Supera Covid Banco Santander/CRUE, €81,000; 4) SENT, Generalitat Valenciana (GVA), €7,978; 5) ValidanT, GVA, €15,956; 6) Sara, UJI, €17,421; 7) SUCRE, UJI, €21,039; 8) SEnviro for agriculture, UJI, €40,000; 9) SEnviro, INIT, €3,500. Using my project funds, I generated 11 research scholarships for bachelor' s/master' s degree students for 88 months and took on 4 people full-time through an employment contract (32 months). I obtained 2 grants to carry out stays in a company (€40,000 each) by GVA. I participate as an expert certification evaluator of R&D&I projects by the ACIE. As PI, I signed 22 contracts (Art. 83) with companies (€40,440). I have won entrepreneurship awards.

2 doctoral theses have been supervised (defenced in March and April 2023), and 2 more are currently being supervised. None of my PhD students are Spanish, 1 of them in the A-wear project (ITN) with Reggio Calabria University. My role in the Geo-c project (ITN) was as a postdoc in charge of 5 PhD students of different nationalities. I organised internat. events. I supervised 70 master's theses, some of them within the Erasmus Mundus Master's Degree in Geospatial Techn. (internat. students), and 5 bachelor' s theses. I received 6 internat. PhD students to carry out stays during a total of 36 months. I completed 34 months of research stays at different universities and prestigious centres (Joint Research Centre, Nova Lisboa, Zaragoza and Rovira i Virgili Universities with competitive financing (e.g. Jose Castillejo, BEST/GVA) of €38,875 funds. I participated in 25 projects funded by >€3.8M, including 5 intern. (Eurogeoss, Enable, A-wear, Geo-c and Ermes). I participated in 3 research networks: OpenCityData (MINECO), FabSpace 2.0 (EU) and IDEAIS (CYTED).

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**Turno General**

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | GONZÁLEZ VIDAL, AURORA |
| **Referencia:** | RYC2023-043553-I |
| **Correo Electrónico:** | aurora.gonzalez2@um.es |
| **Título:** | Artificial Intelligence and Data Analytics Approaches in Internet of Things-based Smart Environments |

**Resumen de la Memoria:**

The main research line that I have developed is called Artificial Intelligence and Data Analytics Approaches in IoT-based Smart Environments. Smart environment is a term that characterizes environments whose context is monitored by sensors. The data gathered by those sensors can be processed for extracting information and this information is then exposed to Artificial Intelligence algorithms for knowledge extraction. Such knowledge can be then used for creating new services or automatising existing ones through data-based decision-making solutions. In that sense, my research line has two clear and well-defined paths that I have contributed to. One of them deals with the problems of real data that come from smart environments, which presents several challenges such as high volume, in terms of both data samples and collected features, high velocity because it is very fast and many times volatile, and presents missing values because sensors are affected by real-life problems such as communication loss, cyberattacks, and limited resources. The other path of the same research line is about adopting those algorithms and others so that we can extract knowledge out of the information and apply such knowledge to specific areas such as buildings, cities, transportation, industry 4.0, agriculture, security, and health.

My research line has evolved from an initial point in which we started studying IoT-based solutions for smart buildings and Big Data solutions for energy-related scenarios and then the area of application of the developed solutions was enlarged by including agriculture, transportation, and security problems. In my postdoctoral stages, I am trying to promote the emergence of real intelligence through the idea of transfer learning between domains, digital twins, and other tools that allow us to work globally, not in isolated cases.

From an advisor/teacher point of view, I started providing advice to researchers with regards to statistical analysis, and then I was a teacher on several R courses, after that, I started participating as a teacher in the Big Data Master, directing final degree theses, final master theses and currently co-directing Ph.D. thesis and leading young researchers that are collaborating in European
Projects.

In addition, I was accredited as an Associate Professor ("Contratado Doctor") by the Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA) in 2020 and I hold several language certificates (C2 in English, B2 in French, A1.2 in modern Greek)

My career could be divided into the following stages:
* Statistical consultancy and R/open source community (2014 - nowadays)
* Predoctoral stage (2015-2019), focus: Smart buildings and smart cities – FPI scholarship and projects EDISON and ENTROPY. First, studied the Big Data Master and later on, teaching and supporting students.
3* 1st postdoctoral stage (2020-2021), focus: Smart agriculture (projects DEMETER, WATERMED) - Fundación Séneca contract. Also: AI applied to security + other topics (health and mobility)
4* 2nd postdoctoral stage (2021-2022), focus: Smart buildings - Margarita Salas contract, full time in a stay at CERTH/ITI (Greece).
5* 3rd postdoctoral stage (2023-now), focus: monitoring solutions and AI applied to marine sciences - ThinInAzul contract

**Resumen del Currículum Vitae:**

Aurora González Vidal graduated in Mathematics from the University of Murcia in 2014. In 2015, she obtained a scholarship to work in the Statistical Division of the Research Support Service, specializing in Statistics and Data Analysis while getting a Master's Degree in Training of Teachers (UMH). Later, she pursued a Master's in Big Data. In 2019, she earned a Ph.D. in Computer Science, focusing on "Data Analysis and Artificial Intelligence applied in real environments based on the Internet of Things" at the DIIC at the University of Murcia.

Her research interests are the development of algorithms for solving Big Data challenges in real scenarios such as time series representation and feature selection or missing values imputation, and the application of Artificial Intelligence for the emergence of smart environments such as buildings, transportation, agriculture, and security, based on knowledge extraction from real Internet of Things data.
She has collaborated on various national and European projects in those fields, for example, PHOENIX (smart buildings) and DEMETER (agriculture 4.0), and currently, she is the co-IP in the NGI Search project, where they are financing new projects for open solutions towards the search and discovery of information on the internet.

Having conducted numerous research stays at prestigious centers in England, Australia, the United States, and Greece, she is currently a postdoctoral researcher at the University of Murcia in the "ThinkInAzul" project of the Complementary Plan for Marine Sciences. In this project, she aims to address new challenges in the marine and coastal environment through monitoring, data processing, and the application of Artificial Intelligence techniques to the collected data.

She is very active in the dissemination of knowledge and leading young researchers, including master's and degree theses linked to projects and 1 Ph.D. student. She has been the president of the R Murcia Users Association (UMUR) since its foundation.

She has published 31 research papers (17 Q1, from which 8 are Decile 1) and 30 conference papers (22 international and 8 national), h-index = 16, 1214 citations (google scholar), and has received 5 research awards.

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**Turno General**

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | GONZÁLEZ ANDRADE, DAVID |
| **Referencia:** | RYC2023-045670-I |
| **Correo Electrónico:** | davidgonzalezandrade92@gmail.com |
| **Título:** | Subwavelength metamaterials for silicon photonics |

**Resumen de la Memoria:**

I am a Marie Sklodowska-Curie Postdoctoral Researcher at the Center for Nanoscience and Nanotechnologies (C2N), a joint research unit between the Univ. Paris-Saclay (#1 EU, Shangai Ranking) and the Centre National de la Recherche Scientifique (CNRS). My research focuses on the development of advanced silicon photonic devices that leverage subwavelength nanostructuration to address the needs of emerging applications that are not feasible with current silicon photonics technology. It lies at the boundaries between different disciplines and cutting-edge technologies (e.g., photonics, metamaterials, optomechanics, radiofrequency).

As a PhD student (IO-CSIC), I developed several groundbreaking devices that reported significant advances in the fields of mode-division multiplexing (MDM), optical phase shifting and beam splitting. Specifically, I demonstrated i) the first mode multiplexer based on a subwavelength engineered MMI coupler, allowing a three-fold bandwidth enhancement compared to the state of the art; ii) a new design strategy relying on modal- and symmetry-engineering of slotted waveguides to prevent wavelength-dependent mode beating and ensure equal power splitting, demonstrating world-record bandwidth; and iii) nanophotonic phase shifters with broadest operating bandwidth reported to date. In my 1-year postdoct at IO-CSIC, I led two research lines to: i) develop novel architectures for MDM supporting a large number of modes and a broad operating bandwidth and ii) the demonstration of the first fiber-chip interfaces for 10 Gbit symmetric passive optical networks, as well as ultra-broadband spatial-heterodyne Fourier-transform spectrometers with the highest optical throughput for high precision sensing. These results were published in 8 publications in high impact Q1 journals (1 in top 12% of JCR-Optics: Photonics Research), earned several awards and were covered by intl. press releases.

In 2021, I moved to C2N as a senior researcher of the GENIUS project, in which I led a research line on on-chip optical beam forming for different multiplexing technologies. I was also involved in 3 French national projects for the development of active silicon optomechanics, silicon photonics for high dimension frequency entanglement and carbon nanotubes for integrated nonlinear optics. Moreover, I successfully applied for funding, a highly competitive and prestigious Marie Sklodowska-Curie Postdoctoral Fellowship, initiating a new research line in the group on silicon Brillouin-assisted optoelectronic oscillator based on SWG membranes as PI. During this period, I have supervised and mentored 6 PhD students and 5 MSc students at different institutions (IO-CSIC, UCM, UC3M, C2N), and this work has resulted in 8 publications in top journals (1 in top 8% of JCR-Optics).

In my future work, I aim to expand the development of crucial building blocks with fundamental significance in optical communications and sensing. The potential of these components will be demonstrated through their integration in a complex on-chip system for high-channel count optical communications based on mode-division multiplexing. Another research line of my project will be devoted to building new bridges between subwavelength metamaterials and Brillouin optomechanics.

**Resumen del Currículum Vitae:**

I am an experienced researcher with >8 years of experience in the design, fabrication, and experimental characterization of nanostructured silicon photonic devices with high performance and novel functionalities.

In 2017, I was granted an FPI (68 k€) to conduct my PhD at the Institute of Optics of the Spanish National Research Council (IO-CSIC) in the field of subwavelength metamaterials for the development of high-performance photonic microdevices. I conceived several groundbreaking ideas that led to the demonstration of silicon photonic devices with world-record performance, addressing relevant challenges related to the application of silicon photonics for communications and sensing. I carried out 3 long research stays (total of 8 months) at Univ. Paris-Saclay, McGill Univ. and NRC, building a wide intl. collaboration network. In 2020, I received my PhD from the UCM with Cum Laude and intl. mentions. Two best PhD Thesis awards from the COIT-AEIT (2 k€) and the Madrid City Council (4 k€) endorse the high quality of my PhD outcomes.

I was postdoc for one more year at the IO-CSIC funded by a postdoctoral fellowship (POP-FPI, 25 k€). I was responsible for setting up from scratch the group's laboratory and I leaded two industry-academia research lines. In June 2021, I joined the C2N as a postdoctoral associate, where I led a novel research line on on-chip optical beam forming for error-free transmission of multiplexed high-speed data streams (40 Gbps each). Remarkably, I wrote and was granted a highly competitive Marie Curie Postdoctoral Fellowship (score 98/100, 196 k€) for which I am currently PI, initiating a new research line in the group on the development of Brillouin-assisted optoelectronic oscillators based on subwavelength silicon membranes.

I have a total of 54 publications in high-impact journals and intl. conferences, of which 16 are articles (2 of them within the top 12% journals of JCR-Optics). My current h-index is 9, with >290 citations (Scholar). I have participated in 15 R&D competitive projects (1 as coordinator, 2 as senior researcher, 1 as PI) and in 3 contracts with private companies, with >50 intl. collaborators and >14 M€ of funding. The impact on technology transfer is illustrated by my 8 patents. 1 patent family led to the creation of the spin-off Alcyon Photonics and has been licensed for exploitation. My work has been presented in 92 national and intl. conferences with 39 invited presentations (Photonics West, CLEO, OFC), at 7 renowned institutions (UB, CEMDATIC, UCM, UMA) and has been covered by intl. press mentions (>20).

I have supervised and mentored 6 PhD and 5 MSc students, have been external reviewer of 2 PhD Thesis and in 1 Thesis committee, I serve as reviewer in >8 different Q1 journals and I am associate editor of a new journal on optical technologies. I am fully committed and involved in different activities to disseminate science to a broad audience. I have taught 2 courses on photonic simulation, have been supervisor of undergraduate students (UCM)

and organizer of the 1st SINFOTON2 Fall Fair, the 7th ePIXfab Summer School and a Photonics Workshop. I also do science outreach on a regular basis to schoolchildren (Fête de la Science) and high-school students (4º ESO+Empresa) and organize activities for PhDs and postdocs.

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| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
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| **Título:** | Blockchain-based Swarm Robotics Systems |

**Resumen de la Memoria:**

I have established a research career in the field of distributed robotics, with a current focus in Swarm Robotics Systems (SRS) and blockchain-based technology. Driven by a passion for robotics, I completed my undergraduate studies at the University of Portsmouth, UK, then my master's and Ph.D. degrees in Robotics Engineering at Osaka University, Japan. In my Ph.D. work (defended in Sep. 2016), I developed methods and algorithms for SRS that need to adapt to changing environments without human supervision.

After my Ph.D., I became a postdoctoral researcher at MIT (USA) and pioneered the field of blockchain-based robotics (beginning in 2016). I received a Marie Curie Individual Fellowship to continue developing this new field at the MIT Media Lab, and I showed that, by using cryptographic functions, new security models can be implemented in order to give data confidentiality and entity validation to robots, making them suitable for trust-sensitive applications.

My research career has been marked by notable publications and recognitions, including over 32 peer-reviewed papers in leading journals and conferences. My work on blockchain-based SRS and securing robotic has been groundbreaking for the field, earning over 1200 citations, an H-index of 15, and the prestigious R3 Certificate for research quality and independence. In addition to my own research, I have played a vital role in building and supporting the research community as a whole, for blockchain-based robotics. I organized the first symposiums, workshops, and academic events in the field and collaborated with a number of prestigious academic and industrial institutions.

Now that I have created the initial synergy of blockchain and robotics and demonstrated the first proof-of-concepts, I plan to move beyond and provide innovative solutions to make distributed robotics systems more secure, cooperative, and deployment-ready: First, security: by including code-based transactions (a.k.a. smart contracts), secure consensus and safe collaborative missions can be easily designed, implemented, and carried out by distributed systems composed of a large number of heterogeneous agents (e.g., people, robots, institutions). Second, explainability: blockchain provides an infrastructure for ensuring that robotic systems follow specified explainability standards, which becomes especially important as these systems are increasingly integrated into human society. Third, economic autonomy: I will develop Decentralized Autonomous Robotic Organizations (DAROs), a new type of SRS in which blockchain is leveraged to provide robotic systems with economic autonomy, a concept poised to have significant impact across a variety of societal and economic sectors.

In summary, my work has pioneered a new field of research in which I continue to be a leading figure. My work has not only advanced the academic understanding of blockchain-based robotics but also has the potential to significantly impact applications in a wide scope of sectors. In my future research, I will use blockchain-based technology to create mature robotic systems that are secure, explainable, and more autonomous.

I was granted an RyC fellowship last year (2022). However, I had to desist it (before concession) because my current employer had not yet applied for hosting RyC researchers. This has been fixed for the 2023 call.

**Resumen del Currículum Vitae:**

I have been exploring swarm robotics systems for more than 15 years, first modeling and simulating large groups of robots, then implementing and validating these systems for several lab-controlled applications, and finally pursuing high-risk research on blockchain-based robotics. I have published 20 peer-reviewed papers in leading international journals (including Science Robotics, IEEE Transactions on Robotics, and Swarm Intelligence) and high-impact robotics conferences (such as IROS, ICRA, and AAMAS). I have an H-index of 15, with 1322 total citations (1185 in the last 5 years). Recently, I have been awarded the R3 Certificate by Agencia Estatal de Investigación (Jan. 2024), which recognizes the quality of my research and my independence as a researcher, complying with the established European standards.

Pioneering a new field: Blockchain robotics. Since the completion of my Ph.D., I have begun my career as an independent investigator, doing highly innovative and pioneering work in blockchain-based robotics. When I began publishing in this domain in 2016, the field did not yet exist and was entirely underexplored. I have published seminal high-impact papers that have become the foundation of this now-growing field and have built a research community around the field by organizing the first international symposiums on blockchain-based robotics at MIT.

Groundbreaking publications. My research on blockchain-based robotics started the field and has been internationally recognized as groundbreaking. My recent high-impact publications made the following advances: (1) In 2016, I was the first to describe a variety of potential applications for blockchain technology in swarm robotics, such as secure communication, data logging, and consensus achievement. (2) In 2018, I proposed with my co-authors the first proof-of-concept system that uses the Ethereum blockchain framework for a swarm robotics system in a binary collective decision-making scenario. This research shows for the first time that a smart contract protects the quality of collective decisions from byzantine robots (i.e., malicious robots programmed to breach consensus) in the system, by adding a blockchain security layer. (3) We expanded this concept with an extensive comparative analysis between state-of-the-art collective decision-making algorithms and smart contracts. (4) I then showed how blockchain-based distributed robotics systems can prevent threats such as impersonation attacks in follow-the-leader missions by analyzing the history of transactions

robots leave in the blockchain. (5) Finally, in 2021, I built and demonstrated the first published instance of a swarm robotics system being hired for a job using blockchain-based financial assets.

Pivotal figure in the research community. I organized the main symposiums and workshops in the blockchain robotics field (BROS 2018, BRAIS 2019, and IROS 2021 Blockchain and automation Workshop), I acted as editor of the proceedings of the first symposium on blockchain for robotics systems, and I am regarded as a pivotal figure in the field. These are a few articles covering my work (in several languages): Blockchain technology could provide secure communications for robot teams - MIT News (09/2021), Los españoles que reimaginan el mundo desde la meca de la innovación - ABC (09/2021), ¿Puedes probar lo que dices robot? - El Español (07/2021), How Blockchain Could Make Robot Swarms Smarter - Coindesk (08/2016).

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | GARCÍA FERNÁNDEZ, MARÍA |
| **Referencia:** | RYC2023-043020-I |
| **Correo Electrónico:** | mariagarciafernandez92@gmail.com |
| **Título:** | Wireless sensing on board drones: subsurface radar imaging and antenna measurement |

**Resumen de la Memoria:**

Dr Garcia-Fernandez's research experience falls within the broad field of applied electromagnetics, focusing on three main lines: subsurface radar imaging, antenna measurement, and computational imaging.

At the beginning of her scientific career, she worked on optimization techniques for electromagnetic imaging. Since 2015, she has been promoting a new research line focused on drone-mounted subsurface radar imaging systems to detect buried explosives (i.e., landmines and Improvised Explosive Devices, IEDs). Involving drones in subsurface detection extends the capability and safety of threat detection significantly. The drone can operate at a safe distance from human operators, hence serving as a flexible radar platform for interrogating regions of ground from various nearby vantage points. Furthermore, she also developed antenna measurement systems on board drones, as she envisaged the great potential of this technology to enable antenna diagnosis at operational conditions. In particular, this technology brings significant advantages due to the ability of drones to reach difficult-to-access areas (hence enabling the safe inspection of antennas in challenging places) and efficiency (avoiding the need of interrupting the service to measure the antenna). The excellent results achieved in these two research lines have positioned her as one of the leaders in the emerging field of microwave sensing on board drones.

Aware of the limitations of conventional radar imaging systems (mainly related to low acquisition and processing speeds), she proposed to leverage the computational imaging paradigm for inspecting scenarios involving dielectric media (e.g., through-the-wall and subsurface sensing), obtaining a prestigious Marie Sklodowska-Curie (MSCA) Grant. Based on compressive sensing, computational imaging resorts to compressive antennas which, by radiating quasi-random patterns, can physically compress the scene information into a single channel (or a reduced number of them). Compared to conventional radar imaging, this innovative approach enables to reconstruct images of the inspected scene from far fewer measurements, yielding a drastic reduction in the inspection time. However, a key limitation is that the complexity is transferred to the signal processing layer, resulting in a high computational burden. Another concern is the reduced signal to clutter ratio, which is related to a limited illumination of the scene. Hence, in the framework of this Ramón y Cajal Grant, the candidate proposes to address these challenges by leveraging artificial intelligence techniques. The ultimate goal of this new research line is to develop an innovative subsurface imaging system able of inspecting large scenarios fast and intelligently, by blending computational imaging and artificial intelligence.

**Resumen del Currículum Vitae:**

Maria Garcia-Fernandez received the BSc, MSc and PhD degrees in Telecommunication Engineering from University of Oviedo (Spain) in 2014, 2016 and 2019, respectively, and the BSc in Mathematics from UNED (Spain) in 2023. She started to collaborate with the Group of Signal Theory and Communications at University of Oviedo in 2013, where she worked as FPU Predoctoral Researcher from 2016 to 2019, and as Postdoctoral Researcher until 2022. She has also carried out several research stays abroad, aiming to build and foster international collaborations. She was a Visiting Scholar with the Gordon Center for Subsurface Sensing and Imaging Systems, Northeastern University (Boston, MA, USA) in 2018, and a Visiting Researcher with the Radar Department of TNO (The Hague, The Netherlands) in 2019. In January 2022 she joined Queen's University Belfast as Visiting Scholar, and since January 2023 she leads her own research line within a prestigious Marie Sklodowska-Curie (MSCA) grant.

At the beginning of her scientific career, she worked on optimization techniques for electromagnetic imaging, and since 2015, she has been promoting a new research line focused on radar systems on board drones for subsurface imaging. Later, she also promoted the development of antenna measurement systems on board drones, coining the term of "beyond-the-visible" applications with drones. The excellent results achieved have positioned her as one of the leaders in the emerging field of microwave sensing on board drones. In 2022 she began to work in computational imaging, a novel radar paradigm based on compressive sensing that aims to address some drawbacks of conventional radar systems.

Throughout her prolific career she has authored 28 articles in peer-reviewed journals (14 as first author, 25 in Q1/Q2) and more than 40 contributions to conferences (27 as first author), achieving around 800 citations and an h-index of 14. Her work has been recognized with numerous awards, such as the Best Student Paper Award in EuCAP 2019; two Galileo Masters Awards in 2019 (sponsored by the European Commission) and one National Award to the Best PhD Thesis on Telecommunication Engineering in 2020. She also received the prestigious National Youth Award (Spanish Ministry of Social Rights and 2030 Agenda) in 2021, recognizing her trajectory and her commitment to foster the societal impact of her research.

The above-mentioned systems on board drones have been patented in Spain, and their protection has been internationally extended. She has participated in 12 regional, national and European research projects (worth >€3.5M), contributing significantly to secure follow-up funding. Regarding the technology transfer, she has participated in 9 contracts with companies and public institutions (worth €850k). Furthermore, she has been invited speaker in several events organized by relevant organizations, such as the 4th and 5th C-IED Technology Workshops (organized by the NATO C-IED Centre of Excellence).

Dr. Garcia-Fernandez has also shown a strong commitment with outreach activities, aiming to bring science closer to society and to promote scientific vocations (e.g., participating in the European Researchers' Night, organizing activities within "Open Doors" events). Additionally, she also collaborates with initiatives that promote careers in STEM especially among young women.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
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| **Título:** | Graphene-based optoelectronic devices for THz applications and technology |

**Resumen de la Memoria:**

My research career has been developed in 3 international institutions: First as PhD student (2014-2019, USAL) supported by two personal research grants. After obtaining my PhD (Cum Laude and international mention) I was awarded with the prestigious JSPS (Japan Society for the Promotion of Science) fellowship to undertake my first Postdoctoral (PD) stay (2019-2020) at Tohoku University (Japan) where I started a new research line focused on THz optoelectronic devices based on stacked 2d materials. Due to the COVID pandemic and borders closure I was forced to have break in my career, but I managed to get a 3 months PD position at USAL. After that, I joined CENTERA (2021-2022) to undertake my second international PD stay. This is a R&D unit to develop breakthrough THz technologies where I kept developing my career in this application-relevant field. In 2022, I was awarded with a Maria Zambrano (MZ) distinguished researcher fellowship at USAL (2022-2024) to carry out my personal research project based on novel plasmonic THz devices.

So far, my goal has been the development of groundbreaking THz technology leading to the observation of intriguing phenomena which is important for future applications and technology. Accordingly, three key breakthroughs in my scientific career were: i) the development of a pioneering THz sensor based on graphene with a double asymmetric grating structure (APL Photonics 5, 066102, 2020), ii) the enhancement of the sensitivity of state-of-the-art graphene photodetectors paving the way towards new record performances (Nanophotonics, vol. 11, no. 3, 519-529, 2022) and iii) the first-ever demonstration of functional frequency-selective and frequency-tunable THz detection at ambient conditions using graphene transistors (Nano Letters, 24, 3, 935-942, 2024).

My mid/long-term goal is to experimentally assess the potential of realize a new class of twistable optoelectronics devices for THz and IR frequencies in which their properties can be manipulated on demand by the rotation angle between assembled materials. This exciting and emerging field in the world of 2D crystals have a huge potential for communication, sensing or emission technologies at THz frequencies, easing the developing of functional, scalable, low cost and high-performance technologies operating at application-relevant room temperature.

**Resumen del Currículum Vitae:**

I'm a hands-on experimental researcher (PhD 2019) specialized in the fabrication and characterization of optoelectronic nanodevices made from novel materials for THz technologies. I've a background in Physics science including 5-years BSc (2013) and a MSc (2014, best student award).

My current position is "Maria Zambrano Researcher" at University of Salamanca, supported by a personal grant for attracting scientific talent. My research career has been developed in 3 international institutions: i) University of Salamanca, Spain as Lecturer Assistant, PhD and Postdoctoral researcher, ii) Tohoku University in Japan as JSPS (Japan Society for the Promotion of Science) Postdoctoral Fellow (2019-2020) and iii) the Institute of High Pressure of Physics – CENTERA Laboratories in Poland as Postdoctoral researcher (2021-2022).

Overall, I have authored 22 articles (8 as First Author, 1 as Last Author and 3 as Corresponding author - some of them published in high-impact journals such as Nano Letters, Nature Communications or Nanophotonics) and 2 book chapters. I presented my results in more than 40 conferences, 8 as invited speaker and 4 as organizer including also 15 conference proceedings. My h-index is 11 (statistics from Google Scholar). I have secured so far >200k€to undertake Research & Development projects in both academic institutions and industry, participating in 16 projects in total (4 as Principal Investigator) at European, National or Regional levels. I have supervised 5 students at BSc/MSc/PhD levels, taught courses at BSc/MSc levels (USAL) and led Educational Innovation Projects. Also, I have designed, installed, and managed multiple-user lab. facilities, including photocurrent THz spectroscopy systems at low temperatures and clean room equipment for nanofabrication.

| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
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| **Título:** | Robust and Trustworthy AI Systems: Addressing Vulnerabilities and Points of Failure of AI Systems Deployed in High-Risk Applications |

**Resumen de la Memoria:**

The line of research to be developed is in the context of robustness and explainability of Artificial Intelligence (AI) systems. With AI increasingly integrated into decision-making processes and autonomous systems, the challenges posed by its use in an ever-increasing number of areas have serious implications for citizens and organizations, as recognized by the EU AI Act. Despite their performances, AI systems are not yet considered as reliable enough to be fully autonomous in complex environments without human supervision. Beyond the classical software vulnerabilities that are inherent to any piece of software, AI systems open up new surfaces of vulnerabilities, many of which remain largely unexplored outside of the Computer Vision domain. Addressing these challenges is pivotal for deploying secure and dependable AI systems, particularly in high-risk scenarios. To this end, this proposal will provide a comprehensive assessment of the reliability and robustness of AI systems in multiple domains, including cybersecurity, healthcare, finance, and agriculture. This research proposal will focus on three specific areas to advance robust and trustworthy AI systems in high-risk scenarios:

1/ Vulnerabilities, failures modes and attack surfaces. It will investigate the vulnerabilities, failure modes, and attack surfaces of AI-based systems deployed in high-risk applications, including (1) evasion attacks, (2) poisoning attacks and (3) model extraction and inference attacks.

2/Risk mitigation strategies and adversarial defenses. It will explore strategies to mitigate the risk of the different failure modes, adversarial threats and minimize the attack surfaces of AI-based systems, including algorithms that prioritize security compliance and potential certification schemes.

3/Interpretability and explainability. It will develop processes and tools for testing, evaluating, and analyzing AI-based systems, including tools to interpret and explain the output of the AI-based systems.

The research proposal will explore the weaknesses and limitations of AI-based systems deployed in high-risk applications, develop effective attack strategies, and create risk mitigation strategies and robust defenses. This multifaceted approach aims to advance our understanding of the vulnerabilities and countermeasures to pave the way for the development and deployment of robust and secure AI systems in high-risk applications. This research is vital for advancing the field by enabling safer and more dependable use of AI technology across diverse domains. To this end, Daniel will collaborate with other researchers from national and international institutions to exchange knowledge and build his network and he will engage in mentoring and supervision of Master and PhD students. Moreover, he plans to collaborate with industry partners to test the developed strategies in real-world scenarios, ensuring practical applicability.

**Resumen del Currículum Vitae:**

Daniel Gibert has been awarded various predoctoral (Industrial doctorate and UdL Fellowship) and postdoctoral national and international excellence grants, including a JDC-incorporacion (FJC2020-044003-I), and a Marie Curie Career-Fit PLUS Fellowship (MF20210266). In terms of scientific production, he has co-authored a total of 20 peer-reviewed publications, including 9 journal publications and 11 conference publications, which has led to a total of 1145 citations in only 7 years of research (including predoctoral and postdoctoral). His PhD thesis received the Cum Laude and the International mention. In addition, he filed a patent application with Blueliv, Leap in Value SL.

Daniel Gibert has participated in 7 research projects, both national and international, including the European H2020 projects SolBio-Rev and SWS-Heating, where he participated as Investigator and led the development of AI agents for energy consumption optimization. Currently, he is the Principal Investigator (PI) of his own research project under a Marie Curie Fellowship (MF20210266), where he is closely collaborating with IBM Research Europe.

In terms of leadership, Daniel Gibert is corresponding/main author in 17/21 of the publications he has coauthored, i.e. 80.95% of his publications, and he has co-authored works in all the research groups he has visited or worked with as well as with his industry partners (Carnegie Mellon University, University of Toulouse, University College Dublin, GREiA Research Group from the University of Lleida, IBM Research Europe, Blueliv, Leap in Value SL). In total, Daniel Gibert has publications in collaboration with 20 researchers. Also relevant is the line of research that he started during his PhD on Artificial Intelligence (AI) for malware detection and classification, funded by an Industrial Doctorate and UdL Fellowship for predoctoral researchers, where he explored how malware detection systems could be improved using machine learning, and deep learning algorithms. Nowadays, he continues investigating this topic at CeADAR, University College Dublin, funded by a Marie Curie Fellowship, focusing on studying the limitations and vulnerabilities of machine learning-based detection systems. During his career, Daniel Gibert has trained, mentored and supervised 2 master thesis, 1 TFG, and 8 internships of master students at CeADAR/University College Dublin (UCD) and National College Ireland (NCI).

In internationalisation, Daniel Gibert had various research stays of three months during his PhD studies at Carnegie Mellon University and the University of Toulouse. Nowadays, he is working at CeADAR, Ireland's Centre for Artificial Intelligence. During the Marie Curie Fellowship, he has been collaborating with (1) Dr. Giulio Zizzo from IBM Research Europe; (2) Dr. Cormac Doherty from UCD's Centre for Cybersecurity and Cybercrime Investigation; (3) Dr. Niall McLaughlin from Queen's University Belfast; (4) Dr. Battista Biggio and Dr. Luca Demetrio from the University of Cagliari and the University of Genova, respectively. Furthermore, Daniel Gibert is part of the Programme Committee of IJCNN'24 and IJCAI'24, and he has been reviewing periodically for the following top-tier conferences and journals including AAAI, IJCAI, J. Computers & Security, J. Artificial Intelligence in Medicine, J. Pattern Recognition, J. Neural Networks,

**AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023**
**Turno General**

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
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| **Título:** | Freehand systems for electromagnetic sensing: handheld radar imaging and antenna diagnosis and characterization |

**Resumen de la Memoria:**

Dr Guillermo Álvarez Narciandi major contributions have been devoted to i) radiofrequency identification (RFID) applications for localization, orientation estimation and tracking, ii) portable systems for antenna diagnosis and characterization, and iii) portable electromagnetic imaging systems, which are currently the main focus of his research.

He has pioneered freehand systems for antenna diagnosis and characterization (protected internationally by a patent), which facilitate agile measurements of antennas, without the need for resorting to specific antenna measurement laboratory facilities. In particular, he developed an initial version that requires full-acquisitions (amplitude and phase), and a phaseless counterpart, which enables to reduce the hardware complexity of the system and to characterize antennas under operational conditions, making the system especially convenient for measurements of already deployed and onboard antennas (e.g., an antenna on a plane or a car).

The applicant has also pioneered freehand imaging systems, bypassing the need for bulky and complex radar systems comprising a large number of transmitters (TXs) and receivers (RXs) to produce high-resolution images. Instead, these systems rely on a compact millimeter-wave (mmWave) radar-on-chip module, which is moved by hand over the area under inspection by an operator while its position is tracked, to deliver high-resolution images in real-time. Furthermore, he has also played a key role in the development of enhanced drone-mounted radar prototypes for landmine and improvised explosive device (IED) detection, and he is currently working on computational imaging systems. The computational imaging paradigm is a novel imaging modality based on the compressive sensing principles that enables to drastically reduced the number of acquisitions required to reconstruct an image of the scene under inspection, which in turn results in a higher survey speed.

Taking advantage of his expertise in different imaging modalities and the adoption of millimeter wave technology by 5G and 6G communication technology, the applicant will foster a new research line with the ultimate goal of redefining the landscape of portable mmWave imaging technology by developing the first integrated imaging and communication enabled freehand computational imaging scanner with real-time operation characteristics. The key aspect is not only to overcome the limitations of existing portable imaging systems, achieving compact imagers providing reduced inspection times, but to natively support integrated real-time high-resolution imaging and advanced communications built on enhanced beamforming and channel estimation capabilities. This will make imaging technology widely accessible to the public, while enabling energy-efficient, more secure communications and reducing the interference level.

**Resumen del Currículum Vitae:**

Dr Guillermo Álvarez Narciandi received the B.Sc. and M.Sc. degree in Telecommunication Engineering from the University of Oviedo, Spain, in 2014 and 2016, respectively. He was also a visiting student at Stanford University in 2014. In 2015, he started collaborating with the Signal Theory and Communications research group of the University of Oviedo (TSC-UNIOVI), and he formally joined the group in 2016, when he was awarded with an FPU grant to fund his PhD, which he completed in July 2020.

Guillermo pioneered freehand imaging systems and freehand systems for antenna diagnosis and characterization (protected internationally by a patent). Furthermore, Dr Álvarez Narciandi has also played a key role in the development of enhanced drone-mounted radar prototypes for landmine and improvised explosive device (IED) detection. In particular, he collaborated with counter-IED experts from the Spanish Ministry of Defense and the NATO Counter-IED Centre of Excellence in the framework of the SAFEDRONE contract.

In January 1st 2022, Guillermo joined Queen's University Belfast as visiting scholar, funded by a Margarita Salas fellowship. During his stage at Queen's University Belfast he dived into the computational imaging paradigm, a novel imaging modality based on the compressive sensing principles. As of January 1st 2023, he is a Marie Sklodowska-Curie Postdoctoral Fellow at Queen's University Belfast.

He has authored 29 scientific publications in international journals (9 as first author), 38 contributions to international conferences, 3 to national symposia, and holds two patents. In addition, he has participated in multiple research projects and innovation contracts.

His research has been internationally recognized with several awards such as the 2nd place in the Best Student Paper Award of the 41st AMTA symposium in 2019, and the MyGalileoDrone 4th prize, awarded by the European Global Navigation Satellite Systems Agency (GSA) in March, 2021. He has also received the 2023 Research Postdoc Award of the Faculty of Engineering and Physical Sciences, Queen's University Belfast.

During his research career Guillermo has collaborated with several internationally recognized research groups and companies. In particular, in 2016 he performed a short stay in Microwave Vision Group Italy and in the German Aerospace Center (DLR). In 2018 he was a visiting scholar at the University of Pisa (Italy), and in 2019 he visited the Institute of Electronics, Microelectronics and Nanotechnology (IEMN), University of Lille (France).

The applicant also collaborates with scientific journals and international conferences. In particular, he currently co-organizes a Special Cluster in the journal IEEE AWPL, in which he is a guest editor. He was also guest editor of a Special Issue in Remote Sensing, and has organized a Focused Session to be held at the 2024 IEEE International Symposium on Antennas and Propagation. In addition, he regularly serves as reviewer of multiple journals and conferences. Furthermore, the applicant has been appointed 2024 Young Professional Ambassador of the IEEE Antennas and Propagation Society (AP-S), and has participated in multiple outreach activities such as the European Researcher's Night and the Science and Technology Week.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | FANECA RUEDAS, JOAQUÍN |
| **Referencia:** | RYC2023-043256-I |
| **Correo Electrónico:** | joaquin.faneca@gmail.com |
| **Título:** | Silicon Nitride photonic integrated circuits |

**Resumen de la Memoria:**

J. Faneca previous research work focused on individual integrated components for optical communications applications, such as filters, photonic memories, optical modulators, optical switches, neuromorphic computing, among others. In this area, he went one-step further implementing low power consumption devices using non-volatile materials, which keeps being an area of outmost interest nowadays. He has also developed semiconductor fabrication skills during 8 years, being able to control all the steps in the fabrication process flow, building photonic integrated blocks and experimental set-ups for integrated circuits measurements.

In the research line to be developed, J. Faneca will exploit the gained knowledge during his past years and will go one-step further, developing a complete technological platform where tuning the SiNx properties during the fabrications, the material will be defined. Once the material is defined, the fabrication processes will be optimized, and therefore the technology. Once all this steps are accomplished, the individual components will be fabricated and characterized, giving rise to a complete process design kit. For achieving this, the research line will be divided into two big blocks. 1) Auto fluorescence and non-linear silicon nitride properties, and 2) Visible integrated photonics technology for quantum applications.

1) Auto fluorescence and non-linear silicon nitride properties. The silicon nitride layers produce auto fluorescence in the visible range of the spectrum. When the light is travelling through a photonic integrated waveguide, in order not to have more wavelengths regimes than the desired one, the eradication of the auto fluorescence is key. This will also avoid interferences between signals and allow improving the signal to noise ratio. In this research line, in order to study the non-linear effects and auto fluorescence in silicon nitride thin films, two different approaches will be carried: 1) Ion implantation on silicon nitride layers and 2) Parametric sweep in the ratio between the precursor gases in the Low Pressure and Plasma Enhanced Chemical Vapour Deposition (LPCVD and PECVD). These two technological processes will allow the tuning in the stoichiometry of the silicon nitride films, which will have different auto fluorescence responses and different non-linear photonic properties. Photonic integrated components will be fabricated in order to maximise the third order non-linear effect and mitigate the auto fluorescence.

2) Visible integrated photonics technology for quantum applications.

In this research line, we propose to focus in the visible range, for applications in quantum communications. Working at these wavelengths, also allow the possibility to fabricate silicon-based photodetectors using CMOS compatible materials. Using nitrogen rich silicon nitride, single-photon emitters can be achieved at room temperature. Combining the single-photon emitters with a stoichiometric silicon nitride waveguide in order to transport the single photon along the photonic circuit and using a CMOS compatible silicon avalanche photodetector, all the key elements for quantum communications are addressed. Apart from the quantum applications, the III-V materials can be used under a hybrid integration approach with the SiNx to include coherent light sources and have different components in the visible.

**Resumen del Currículum Vitae:**

J. Faneca field of expertise is in photonic integrated circuits. Along his research career, he has contributed to the combination of different reconfigurable materials, such as phase change materials, graphene or liquid crystals with silicon and silicon nitride integrated photonic components. This combination has given rise to tuneable individual building blocks, such as, photonic memories, modulators, filters, interferometers, etc., as can be seen in the publication section C.1. Joaquin Faneca has a background in design, simulation, fabrication and characterization of photonic integrated circuits in different ranges of the photonic spectrum (from visible to MIR). He has designed different photonic integrated components (waveguides, interferometers, couplers, etc.) using NAZCA design and KLAYOUT which are open access programmes. Moreover, he can simulate photonic integrated circuits using COMSOL Multiphysics or Lumerical. He has the experience in clean room (8 years), fabricating photonic integrated devices, from PECVD deposition, EBL lithography, Deep-UV lithography, RIE etching, sputtering, and thermal evaporator. He has built complex photonic characterization set-ups for near-infrared devices and non-linear integrated photonics. All this work has been published in different scientific journals with 324 citations around the world giving an h-index of 10. He has given 7 invited talks in international photonic conferences apart of assisting to 21 international conferences presenting oral talks and posters, some of them reflected in section C.2. He has being the photonics lab responsible from 2018-2020 at University of Exeter and from year 2022 at IMB-CNM. J. Faneca has supervised 5 master thesis, 3 bachelor thesis and is currently supervising 2 PhD students, showing leadership. He is also reviewer for technical journals being leading in its categories: IEEE J. Lightwave Technology (Optics: 10/101, IF: 4.7), Scientific Reports (Multidisciplinar: 19/74. FI: 4.997), Optics Express (Optics: 28/101. FI: 3.833), Optical Materials Express (Optics: 38/161. FI: 3.074), and Nanoscale Research Letters (Applied Physics: 36/101. FI: 5.418). J. Faneca is member of Optical Society of America (OSA), International Society for Optical Engineering (SPIE), Institute of Electrical and Electronics Engineers (IEEE), and the IMB-CNM representative for photonics integration in Southern European Cluster in Photonics and Optics (SECPhO), in European Silicon Photonics Alliance (ePIXfab), in QTEP, Quantum Technologies platform at CSIC, and part of the technical committee from 2022 of IEEE photonics conference in communications and devices section. He has demonstrated internationalization collaborating with more than 7 different countries and leaders in the field around the world which can be seen in the work generated in the publications. He obtained a SPIE student grant (3000$) which is given only to 85 outstanding individuals around the world, including J. Faneca, for their potential long-range contribution to optics, photonics. J. Faneca was the president of the Exeter SPIE and OSA optical society chapters during the years 2018-2019 and the outreach responsible in 2017. J. Faneca has developed technology advances together with private companies such as LUMENTUM LLC, VLC photonics, Graphenea and Indizen Optical technologies.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | CASINO CEMBELLIN, FRANCISCO JOSE |
| **Referencia:** | RYC2023-044857-I |
| **Correo Electrónico:** | fran.casino@gmail.com |
| **Título:** | Cognitive Security: A multidisciplinary approach towards the next generation cybersecurity |

**Resumen de la Memoria:**

His doctoral thesis was on recommendation systems, artificial intelligence and privacy. In his postdoctoral stay in Greece, the applicant acquired new capacities at the research level with new lines oriented to cybersecurity, supply chain, and blockchain and prepared national and international proposals and projects. The applicant is a current beneficiary of a competitive Beatriu de Pinós scholarship (BP 2020 00035).

Apart from helping in project coordination, research, proposal writing and other leadership related activities through the University of Piraeus and Athena Research Center over the projects and personal contracts listed in his CVA, he is the PI of a proposal under review (EU COST Action), which has ensured the participation of 26 countries. He has collaborated with multidisciplinary teams in research and projects (e.g. developers, forensic analysts, police officers, judges and law experts, ethics experts, and research experts in other areas). He has carried out research stays (e.g., Portugal, Czech Republic, Greece) in different research centres and universities for more than five years.

In the medical context, he has contributed to creating applications to improve the quality of life of a wide scope of patients. For example, he contributed to a tool to measure the pain of newborns, the creation of a gaming tool to improve the capacities of people with cerebral palsy (GAME-ABLING project GA 315032), and the creation of a tool to assist users with cognitive impairment and alzheimer (SIMPATIC and ANTICIPATE projects). He also contributed to several publications on wireless characterisation in medical contexts and ambient assisted living, including a route recommender system (https://ieeexplore.ieee.org/abstract/document/8106878) for users with physical impairments. The above states a direct impact on society by contributing to its security, privacy, and healthcare, and enhancing the trust in technology and overall quality of life.

The applicant has contributed to dissemination activities at multiple events and congresses as a result of his research results as well as his participation in projects (i.e., he has presented his research or projects on more than 15 occasions in international venues). He has also participated in networking events through other congresses and research stays, where the applicant has presented his background and his collaborations at different levels, research activities, and projects.

He has been a programme member committee of more than 15 international congresses. He has participated in the organising committee of an international conference (SEEDA-CECNSM 2019). He has also been invited to international events to give talks. Some examples of invited talks are:
-(2023) Tools to fight CSA/CSE under HEROES and ALUNA projects. At International Centre for Missing & Exploited Children 2023 Summit and Gala, in Parma, Italy
-(2022) Fighting next generation cybercrime with a holistic perspective. At Dpt. of Intelligent Systems, FIT BUT, Brno, Czech Republic

In addition to the current lines of research, which can be identified with keywords such as pattern recognition, data management, privacy protection, cybercrime and digital investigations, recommender systems, supply chain, and blockchain, the researcher wants to explore a new multidisciplinary line towards cognitive security sistems.

**Resumen del Currículum Vitae:**

Fran Casino is a postdoctoral researcher in the Department of Computer Engineering and Mathematics at Rovira i Virgili University (URV) (Tarragona, Spain), and in Athena Research Center (Athens, Greece). He received a Ph.D. in Computer Science from URV in 2017 with honours (A cum laude) as well as the best dissertation award. He completed several stays in international research institutions for more than five years, including ISCTE-IUL (Portugal), the University of Piraeus and Athena Research Center, both in Greece.

He has participated in several national and international projects covering different tasks such as proposal writing, coordination, research, development, testing and validation, and dissemination. He has actively participated in European projects such as ALUNA (GA 101084929), LAZARUS (GA 101070303), CTC (GA 101036276), HEROES (GA 101021801), LOCARD (GA 832735), YAKSHA (GA 780498), OPERANDO (GA 653704), PRACTICIES (GA 740072), MITIGATE (GA 653212), GAME-ABLING (FP7-SME-2012-1-315032) and national projects such as SIMPATIC (RECERCAIXA 2013-2015), ARES (CONSOLIDER INGENIO 2010), and CO-PRIVACY (TIN2011-27076-C03-0).

He is the PI of a proposal under review (EU COST Action), which has ensured the participation of 26 countries. He has collaborated with multidisciplinary teams in research and projects (e.g. developers, forensic analysts, police officers, judges and law experts, ethics experts, and research experts in other areas).
Regarding collaborations, he is currently participating in the creation of an ISO standard (ISO/IEC JTC1/SC27 WG4), and collaborates with various research centres, and public institutions at the European level, including various Law Enforcement Agencies, Eurojust, and other renowned scientists in his field with whom he has strong scientific collaborations (e.g., Prof. Mauro Conti, Prof. Kim-Kwang Raymond Choo, Prof. Josep Domingo-Ferrer). Overall, he has contributed to creating guidelines, standards (e.g., CWA 17865:2022), and tools with high TRL.

He has supervised one doctoral thesis. He has a teaching portfolio spanning several years at national and international institutions. At the URV in Spain, from 2014 to 2017, he taught courses related to information systems, networks and security. Regarding international teaching, he taught on various subjects at the University of Piraeus in Greece between 2018 and 2021. The topics of these subjects were related to security, blockchain technology,

software development for mobile devices, and medical informatics, for a total of five distinct courses over three years. He acted as an evaluation tribunal member of a Ph.D. thesis (URV, 2019) and as external MSc thesis reviewer (University of Malta, 2020).

His research has an interdisciplinary focus and combines several knowledge areas with disruptive technologies. Some keywords related to his research are pattern recognition, cognitive security, data management, privacy protection, cybercrime and digital investigations, recommender systems, supply chain, and blockchain. He has authored more than 60 international conferences and journals. He is Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), and he was listed in the World's Top 2% most influential Scientists of his field by the Stanford University in 2022 and 2023.

## AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023
### Turno General

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | GENOVÉS GUZMÁN, BORJA |
| **Referencia:** | RYC2023-042518-I |
| **Correo Electrónico:** | borjagenoves@hotmail.com |
| **Título:** | Visible Light Communication for a zero-energy 6G |

**Resumen de la Memoria:**

The applicant has made important contributions in the field of visible light communication (VLC), also referred to as LiFi, and its applicability to Internet of Things (IoT) power-constrained systems. His interdisciplinary research career comprises both analysis and theoretical derivations, and their validation in prototypes. Significant contributions include: Low-power IoT LiFi-enabled systems that attain battery-free IoT devices for its densed deployment; Development of flexible standard-compliant backhaul links for multi-cell LiFi scenarios; Pioneering the exploitation and characterization of multi-color LEDs for addressing link-blockage and inter-cell interference in multi-cell VLC scenarios; Development of LiFi cooperative schemes with white conventional LEDs to enable reliable LiFi systems; Leading research of LiFi in vehicle-to-vehicle and outdoor communications; Design and prototype of LiFi-enabled IoT devices, with small solar cells for data reception and energy harvesting; among others.

The applicant is co-founder and board member of the start-up Sensory-Fi S.L. (LiFi4Food product), offering an integrated, innovative, and sustainable system for monitoring and controlling environmental conditions in high-tech greenhouses. He holds two patents that have been transferred through a technology transfer agreement to Sensory-Fi for their exploitation.

Research results have been disseminated to students and public through multiple activities such as European Researchers Night (3 editions), "Madrid es ciencia" and "Science of Innovation Week" forums, "Science is Wonderful! 2020" in the European Research & Innovation Days, the development of the MOOC "Comunicaciones móviles: en la palma de tu mano" in MiriadaX and edX, with annual reeditions, and multiple TV and press releases.

Internationalization and mobility of the applicant comprises 6 research stays, 4 pre-doctoral and 2 post-doctoral, in Institute Mines Télécom-Télécom SudParis (France), Orange Labs-Lannion (France), University of Southampton (UK), The University of Edinburgh (UK), IMDEA Networks (Spain) and University of Virginia (US). The applicant has spent 32% of his research career in international centers. During the postdoctoral period, 96% of time has been in an institution different from the one in which he obtained the PhD. He has active roles in the organization of seminars/congresses, e.g. chair in the IEEE World Forum-IoT 2023, session chair in IEEE Globecom 2023, chair of tutorial in EWSN 2022, publicity chair of workshop at ACM Mobisys 2021, session chair of workshop in ACM Mobicom 2020, etc. He is member of IEEE ComSoc technical committees and work group member in COST Action CA19111.

Independence and leadership of the applicant is demonstrated with competitive national and European individual grants to develop his own research: Erasmus+, FPU, Juan de la Cierva - Formación, Marie Curie Postdoctoral Global Fellowship. He has also participated in 10 regional, national, and international research projects, 1 of them as principal investigator (PI), and in other technology transfer and supervision activities. He is a reviewer in international journals and conferences and has often performed as TPC member.

The current framework is a valuable opportunity to launch his career as a research group leader within the broad areas of VLC and IoT to attain a zero-energy 6G.

**Resumen del Currículum Vitae:**

Borja Genovés Guzmán is currently working as a postdoctoral researcher in the framework of a Marie Sklodowska-Curie Actions Postdoctoral Global Fellowship in University of Virginia (UVA), United States. His research interests are visible light communications (also referred to as LiFi), Internet of Things (IoT) and low-power wireless communications. After the PhD thesis defense in University Carlos III of Madrid (UC3M) in 2019 (Extraordinary PhD award), he joined IMDEA Networks Institute as a postdoctoral researcher. Moreover, he has carried out research stays in University of Southampton, The University of Edinburgh, and one full-academic year in France (Institute Institute Mines-Télécom and Orange Labs). The total time in international research centers represents 32% of his entire research career. During the postdoctoral period, 96% of his time has been in an institution different from the one in which he obtained the PhD degree.

He has published over 42 peer-reviewed contributions, 16 publications in international journals (12 in Q1 and 4 in Q2), 25 publications in international conferences and 1 book chapter. All publications and data related to them are openly available to the public. He also holds 2 patents (1 published and 1 submitted). The research career has been supported by 2 regional, 3 national, and 5 European research projects, 1 of them as coordinator and principal investigator (PI). The applicant has obtained funding for his personal research projects: 1) Erasmus+ and 2) FPU in the pre-doctoral phase; and 3) Juan de la Cierva-Formación and 4) Marie Curie-Postdoctoral Fellowship in the postdoctoral phase.

The research lines led by the applicant also have an important industrial and societal impact. Specifically, he is contributing to reducing the carbon footprint in smart farming by developing LiFi-based battery-free IoT devices to monitor the environmental conditions. In this sense, the applicant has co-founded Sensory-Fi S.L. (LiFi4Food product). He has contributed to the scientific outreach with the reference open-source and open-hardware OpenVLC platform, organization and participation of seminars, a Massive Open Online Course (MOOC) for students and researchers, and multiple communication activities to the public.

His contributions to the training and mentoring of young researchers includes the supervision of 1 PhD, 2 MSc and 4 BSc theses. He supervised the LiFi section of the PerSys research group at IMDEA for 3 years. He has taught for 5 years in communication engineering courses. He served as project

manager in a European training network and organized multitude of training events for 15 early-stage researchers, among which 8 have already successfully obtained the PhD degree and are working on top research centers. He has been V&T Track Chair of the IEEE World Forum on the Internet of Things 2023, session chair in Globecom 2023, chair of a tutorial at EWSN 2022, among others. Moreover, he actively participates as reviewer in international journals such as IEEE/OSA Journal of Lightwave Technology, IEEE Communication Letters, IEEE Access, IEEE Internet of Things Journal, etc., and in international conferences such as IEEE VTC, IEEE Globecom, IEEE INFOCOM, etc. He usually participates in committees of the IEEE Communication Society.

**Resumen de la Memoria:**

My research interests can be summarized by two things: a thermometer and a biological tissue. I aim to comprehend how monitoring the thermal dynamics of a biological system can yield valuable insights into its health status. The challenge in this subject is that traditional thermometers are highly intrusive and alter the properties of the system under investigation. Upon embarking on my Ph.D., I became aware that remote thermal sensing had been proposed as a solution. However, the most prominent method by that day, infrared thermography, had limitations in providing insights beyond surface-level readings. This shortfall, in turn, prompted the exploration of luminescent nanothermometers (LNThs), which became the primary focus of my research. LNThs are nanoparticles with spectroscopic properties responsive to temperature changes. While their emission range can theoretically span through a wide region of the electromagnetic spectrum, my research emphasized optimizing performance within the so-called biological windows of transparency—specifically, the ranges of 650-950nm, 1000-1350nm, or 1500-1800nm. These windows minimize light scattering and absorption, making LNThs particularly suited for biological applications.

To offer a comprehensive overview of my scientific and technical contributions in the field of luminescence thermometry, the following list is structured to chronicle my journey. It delineates key advancements, each building upon the last, shaping the current focus of my research. A detailed summary is found in my application, and it accompanies each contribution, outlining my level of involvement in its development and its significance to my professional evolution.

As a noteworthy point, I have prioritized Open Science since 2019, striving to publish in journals that provide free access to manuscripts. Furthermore, a substantial portion of the experimental datasets is available in free repositories, primarily Zenodo.

**Resumen del Currículum Vitae:**

My research background includes 42 peer-reviewed manuscripts, where I served as the first author in 13 and corresponding author in 7, accumulating 2290 citations and achieving an h-index of 23. These contributions, spanning the fields of photonics, nanomaterials, and thermometry, have significantly influenced the perception of luminescent thermometers within the scientific community. Beyond unveiling their biomedical potential, such as inferring thermal properties in living tissues, my work has also exposed technical limitations, especially in interpreting luminescence spectra amidst absorbing/scattering media.

Internationally, my impact has been acknowledged with awards at conferences (e.g., ICL2020 and UPCON), while in Brazil, I received the José Leite Lopes prize for the best Physics thesis from the Brazilian Society of Physics and an Honorable Mention from CAPES. During my postdoc, I addressed applicability challenges of luminescent nanoparticles in biological media. Leveraging computational expertise, I introduced innovative approaches like multiparametric regression, transient analysis with in silico simulations, fluorescence lifetime utilization, and machine learning to enhance precision in readouts.

Funding for my research primarily came from public competitive calls for scholarships/contracts. In Brazil, CNPq and CAPES funded my Ph.D., and in Spain, I joined nanotbTech (a FET-OPEN project) at Instituto Ramón y Cajal de Investigación Sanitaria (IRYCIS) and later became a Juan de la Cierva fellow at Universidad Autónoma de Madrid (UAM). Additional funding supports the Retinanothermia project (PID2020-118878RB-I00), where I'm currently part of the research team. These roles expanded my expertise in imaging techniques, including hyperspectral and multispectral imaging, time-gating, magnetic hyperthermia, and data analysis.

I actively participated in administrative aspects, preparing deliverables for nanotbTech, designing the nanoBIG lab at UAM's Medicine Faculty, and managing the budget for extra funds from the JdC-Incorporación fellowship. My research dissemination efforts include 20 international conference presentations, six as an invited speaker, outreach through platforms like Phys.org, and participation in public events such as the European Researcher's Night. Collaboration with BioSpace Lab led to the commercialization of the PhotonIMAGER SWIR prototype, showcasing the practical impact of my work.

In a mentoring role, I guided three Ph.D. theses, contributing to the successful defense of one (Yingli Shen, 2022) and supporting ongoing projects by José Lifante and Liyan Ming. Dr. Shen secured a professorship at Xidian University within a year of her defense, reflecting my commitment to nurturing young researchers. As an editor, I serve on the boards of Sensors (MDPI) and Frontiers in Photonics (FrontiersIn), and as an evaluator, I participated in thesis juries and reviewed projects for the National Science Center (Poland).

An additional accomplishment is my approval in a 2019 competitive call for a permanent Assistant Professor position at the Federal University of Alagoas, which I declined to advance my scientific career in Spain. This decision proved fruitful, as in January 2023, I obtained approval as Profesor Ayudante Doctor at UAM.

**Resumen de la Memoria:**

Sus intereses científicos se centran en el campo del Procesamiento del Lenguaje Natural (PLN). En su etapa predoctoral fue adjudicataria de un contrato del Programa FPU del MECD y realizó su tesis doctoral sobre tratamiento de la negación en español y Análisis de Sentimientos (AS), la cual fue premiada como la mejor tesis en PLN en la XIX edición del premio SEPLN y la cual recibió el premio extraordinario de doctorado y otros 7 premios y reconocimientos de investigación como resultado de sus contribuciones. Cuenta con publicaciones pioneras en el tratamiento de la negación en español, fenómeno clave en tareas de PLN debido a su uso para modificar el sentido de la información en un texto. Ni siquiera Google procesa correctamente la negación en español. Por ejemplo, en la búsqueda "películas que no sean de aventuras", devuelve como resultado películas de aventuras, cuando debería devolver películas de otras temáticas. También ha realizado importantes contribuciones en la tarea de AS y en la generación de corpus. Sus principales logros han sido la definición de la primera tipología de patrones de negación en español, la creación del primer corpus en español anotado con negación y con información sobre cómo afecta al sentimiento expresado en las oraciones, el desarrollo del primer sistema de aprendizaje automático que permite detectar la negación en español y su ámbito de influencia, su aplicación para mejorar el análisis de las opiniones publicadas en la Web, y la organización de las ediciones 2017, 2018 y 2019 de NEGES, primer taller de negación en español creado con el objetivo de avanzar en el estudio de este fenómeno. Además, en este período ha participado también en la organización de la edición 2016 del congreso internacional de la SEPLN, y en la organización de una tarea sobre AS a nivel de aspecto en SemEval 2016. En su etapa postdoctoral, en la que tuvo una interrupción por baja por maternidad, fue adjudicataria de un contrato postdoctoral correspondiente a la Acción 7 de la Universidad de Jaén, de un contrato como investigadora postdoctoral en el proyecto LIVING-LANG (RTI2018-094653-B-C21), de un contrato postdoctoral Juan de la Cierva Formación (FJC2019-041372-I) en la Universidad de Granada y de un contrato postdoctoral de la Junta de Andalucía PAIDI 2020 del programa de ayudas I+D+i (DOC_01073) en la Universidad de Jaén. Durante este período su investigación se ha centrado en el procesamiento de la negación en español, en la generación de recursos y en la detección de discurso de odio y de esperanza. Sus principales contribuciones han sido el análisis de los mensajes de odio publicados en Twitter durante la crisis migratoria de Ceuta, la participación en el desarrollo de un sistema para la detección de discurso de odio en español que mejora las soluciones actuales combinando características lingüísticas y transformers, el desarrollo del primer corpus en español para la detección de esperanza, una API para la detección de negación y la organización de 8 tareas, 3 talleres, 1 congreso y 5 simposios doctorales de relevancia internacional en el área del PLN. A lo largo de su trayectoria ha tenido 6 períodos de movilidad en centros nacionales e internacionales, 2 de ellos en centros internacionales financiados con ayudas competitivas y ha colaborado con investigadores internacionales en más de 20 trabajos de investigación.

**Resumen del Currículum Vitae:**

Doctora en Informática (2019), Especialista en Tratamiento de la Información en Internet (2014), Ingeniera en Informática (2013) y Diplomada en Estadística (2011) por la Universidad de Jaén. Forma parte del grupo de investigación SINAI (TIC-209) y pertenece a la Sociedad Española para el Procesamiento del Lenguaje Natural (PLN), a la red PLN.net y a la comunidad DiverTLes. En el año 2014 fue adjudicataria de un contrato predoctoral del Programa FPU del MECD, en 2020 de un contrato Juan de la Cierva Formación, en 2021, de un contrato I+D+i de la Junta de Andalucía PAIDI 2020 y, en 2023, quedó en reserva en la convocatoria de las Ayudas Ramón y Cajal 2022 con una puntuación de 91,75. Sus intereses científicos se centran en el campo del PLN, siendo su especialidad el tratamiento de la negación en español y el Análisis de Sentimientos (AS), tema en el que realizó su tesis doctoral, la cual fue premiada como la mejor tesis en PLN en la XIX edición del premio SEPLN y la cual recibió el premio extraordinario de doctorado. Su investigación se centra actualmente en el procesamiento de la negación, la generación de recursos y la detección de discurso de odio y de esperanza. Las contribuciones que ha realizado han sido citadas en más de 3.750 trabajos de investigación, con un índice H de 19, y le han llevado a ser galardonada con 9 premios de investigación. Esta producción incluye más de 80 trabajos de investigación, la mayoría de ellos de acceso abierto: 30 publicaciones con proceso anónimo de revisión por pares (11 en revistas JCR (4 Q1; 5 Q2; 1 Q3; 1 Q4)), más de 48 publicaciones en congresos y 2 libros. Ha colaborado con investigadores internacionales de más de 16 centros de investigación diferentes, entre ellos, Simon Fraser University, Vrije Universiteit Amsterdam, National University of Ireland, University of North Texas, Athena Research Center, INAOE y Fondazione Bruno Kessler. Ha realizado 6 estancias de investigación en centros nacionales e internacionales, 2 de ellas en centros internacionales y financiadas con ayudas competitivas. Ha participado en 11 proyectos nacionales y 3 proyectos regionales. También ha estado involucrada en tres contratos de transferencia (art. 83), dos como participante y otro como IP. Ha colaborado como editora de la revista Procesamiento del Lenguaje Natural, del congreso internacional sobre tecnologías del habla y el lenguaje para lenguas de bajos recursos (SPELLL) y de las actas de los talleres NEGES e IberLEF. Además, ha organizado 22 tareas compartidas, talleres y congresos de relevancia internacional en el área del PLN: 2 congresos de la SEPLN en las ediciones 2016 y 2023, 5 talleres sobre procesamiento de la negación y sobre retos del PLN (NEGES 2017, NEGES 2018, IberLEF 2020, IberLEF 2023 e IberLEF 2024), 10 tareas compartidas desde 2016 hasta 2023 sobre temas relevantes como procesamiento de la negación en español, AS basado en aspectos, clasificación de emociones, detección de discurso de la esperanza, detección de transfobia/homofobia e identificación de ideología política en IberLEF como parte de SEPLN, en SemEval y LT-EDI como parte de ACL, en RANLP y en EVALITA, y 5 simposios de doctorado sobre PLN en las ediciones de 2020, 2021, 2022, 2023 y 2024 financiados por la red PLN.net y por el proyecto ILENIA. Ha dirigido más de 30 trabajos fin de título y 1 tesis, y está dirigiendo 2 tesis doctorales.

**Resumen de la Memoria:**

Dr. David Martín-Sacristán Gandía, an expert in 5G and beyond technologies, has made significant contributions to the field through multiple scientific articles (19), conference papers (42), book chapters (4), and patents (2). His research includes topics like radio resource management, link adaptation, channel modeling, V2V communication, mmWave massive MIMO, integrated sensing and communication (ISAC) and digital twin. He has actively participated in simulation activities, modeling, and evaluation methodologies.

Dr. Martín-Sacristán's notable works include articles on 5G V2V communication, low-latency cellular V2V communications, and performance evaluation of 4G and 5G. His involvement ranges from conception and development of ideas to simulation activities and experimental validations.
In addition to academic contributions, he has been involved in various contracts and projects with industry partners such as BMW, Alcatel-Lucent, and Huawei. His role as CTO at Fivecomm involves leading R&D activities and developing final products for clients, showcasing his ability to bridge the gap between research and industry.

The researcher has actively participated in dissemination activities, including publications, oral presentations, and involvement in industry events. His engagement in standardization committees and participation in conferences highlights his commitment to knowledge sharing and community building.

Dr. Martín-Sacristán's internationalization and mobility include collaborations with institutions such as Technical University Ilmenau and the University of Twente in an ITN where he supervises two early-stage researchers. He has been a delegate in various 6G-IA working groups or one6G, emphasizing his commitment to industry collaboration and networking. He has been involved in multiple European projects in FP7, H2020 and Horizon Europe frameworks.

As for independence and leadership, Dr. Martín-Sacristán has been the principal researcher in multiple projects, leading teams and contributing to various aspects of research and development. His role as CTO at Fivecomm further underscores his leadership and decision-making capabilities.

The researcher's future line of research focuses on the concept of a digital twin network for 6G. This involves automatic creation of detailed digital replicas including 3D models with sensing assistance, channel modeling, system-level simulation including cell-free massive MIMO and integrated communication and sensing over open source tools that will be shared with the community, and implementing artificial intelligence for network optimization. Dr. Martín-Sacristán aims to integrate these aspects into a holistic concept of a digital twin network, with a proof-of-concept planned for real-world assessment. This proof will require the integration with real equipment designing an appropriate virtual network function with that aim.

In summary, Dr. David Martín-Sacristán Gandía is a seasoned researcher and industry professional with a strong track record of contributions in the field of telecommunications, particularly in 5G and beyond technologies. His multidimensional approach, combining academic research, industry collaboration, and future-focused initiatives, positions him as a leader in the evolving landscape of wireless communication technologies.

**Resumen del Currículum Vitae:**

Dr. Martín-Sacristán initiated his career in 3G mobile communications modeling, earning the Telefónica Foundation Award for the best Final Project. A Specialization Scholarship followed, focusing on 3G's radio resource management (RRM) and link adaptation. Subsequently, a University Teacher Training (FPU) grant closely linked his activities to national 4G projects and the European WINNER+ project. In 2016, he earned his doctorate, excelling in simulation methodology, channel estimation models, and innovative radio resource management approaches. His postdoctoral work under the METIS-II project explored new 5G evaluations, with an emphasis on vehicular communications. Collaborations with Huawei and the European project 5GCARMEN resulted in several patents. As a principal researcher, Dr. Martín-Sacristán leads projects like ITN-5VC, focusing on channel modeling, RRM, and integrated sensing and communication in vehicular environments. He also leads a UNICO 5G I+D project, concentrating on cell-free massive MIMO and digital twin with machine learning. His substantial contributions to European projects (Horizon 2020) 5G-RECORDS, iNGENIOUS, and FUDGE-5G are noteworthy. Additionally, he actively participates in Horizon Europe projects, including 5G-IANA, 5G-INDUCE, and TARGET-X (with a focus on digital twin). Collaborations with UPV encompass raytracing, beamforming, and cell-free massive MIMO.

Engaging with private companies, Dr. Martín-Sacristán contributed to the development of 4G simulation software and firmware for femtocells (Sistelbanda S.A., 2014). Contracts with BMW, Alcatel-Lucent, and Huawei resulted in two patents. As CTO at Fivecomm, he oversees R&D, leading the development of industry products such as a 5G router and a communication module for water meters (contract with Global Omnium) and a platform to demonstrate robotics used cases over 5G (for Orange and Telefonica). This work has led to two utility models owned by Fivecomm. He conducts demonstrations at public events, including the Valencia Startup Market 2021 (Valencia City Council) and Smart Mobility Valencia 2022. Dr. Martín-Sacristán represents Fivecomm in 6G-IA, one6G, and Ametic.

Dr. Martín-Sacristán has co-directed three doctoral theses at UPV and co-supervised three Master Theses. As a shareholder, member of the Board of Directors, and CTO at 5G Communications for Future Industry Verticals S.L. (Fivecomm), a spinoff of UPV, he played a pivotal role in creating and

managing a team of 18 engineers. He was a member of the local organizing committee of the 7th European Conference on Networks and Communications in 2019 and the 27th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications in 2016. Serving as a TPC member in more than 16 conferences, a reviewer for research papers in eight journals, and a guest editor in the Sustainability special "Vehicular Communications for Sustainable Mobility and Transportation" further highlights his influence.

In 2009, Dr. Martín-Sacristán received the first prize of the III Certamen Valencia Idea in the ICT category. In November 2016, he, along with four colleagues from his research group, received the Juan López de Peñalver Medal awarded by the Spanish Royal Academy of Engineering. Administering the Fivecomm GitHub repository with open resources and data solidifies his commitment to knowledge-sharing.

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| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
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| **Título:** | Thermoelectric devices based on 2D materials for energy harvesting |

**Resumen de la Memoria:**

Throughout my research career I have worked on many different research topics and my expertise covers a wide range of experimental techniques. My career has mainly focused on studying the different properties of two-dimensional materials. However, when I was working at the Instituto de Ciencia de Materiales de Madrid a few years ago, driven by the climate and energy crisis, I became interested in finding ways to produce or use energy in a clean and environmentally friendly way. In particular, I started working on the development of materials for thermoelectric devices (TDs). TDs aim to harvest the energy lost as heat in any processes. I started to study this effect in magnetic multilayers and built devices to try to increase their energy density. More recently, we have modified the multilayers to increase the thermoelectric response of these materials. Since I am back at the Universidad Autonoma de Madrid, I have been working on combining my two areas of expertise: 2D materials and thermoelectric devices. In collaboration with Prof. Zamora's group at UAM and Prof. Segura at the UCM, we hope to be able to design and fabricate scalable, cheap and efficient thermoelectric devices.

The research proposed to be carried out during this period is related to the "Proyecto de Generación de Conocimiento" that we have recently obtained from the Ministry of Science and Innovation. This project is coordinated with the group of F Zamora at UAM, and J.L. Segura's group at UCM. On the one hand, F. Zamora's group has extensive experience in the exfoliation of 2D materials in liquid phase (LPE). This production method is by far the most scalable of all. In collaboration with our group, we have developed methods of deposition of these materials on surfaces such as nebulization. On the other hand, the main contribution of JL Segura's group is the synthesis of Covalent Organic Frameworks (COFs). The properties of these membranes depend on their configuration and composition, which are easily controllable, so basically, we can have membranes with a wide range of electronic, magnetic, mechanical, etc. properties. Collaboration with these groups will allow us to develop devices very close to the final applications.

Due to my previous experience, our group will focus mainly on energy harvesting applications, specifically thermoelectric generators (TGs). We propose to fabricate thermoelectric devices based on the Seebeck effect and on the Anomalous Nernst Effect with liquid phase exfoliated 2D materials. My expertise in device fabrication, characterization techniques, instrumentation and 2D materials will be fundamental for the development of the project. I will design and fabricate devices and perform the electrical measurements.

To achieve the proposed objectives, it will be necessary a lot of instrumental development, which I think is fundamental for a healthy science, especially in a country with such a deficit of technological industry as Spain. We hope that this development serves as the basis for the achievement of many the scientific objectives of the project and will sometimes be patentable.

**Resumen del Currículum Vitae:**

I obtained my PhD with extraordinary award in 2016 from the Universidad Autonoma de Madrid. The main part of my PhD was the study of the influence of thermal fluctuations on the mechanical properties of graphene and the impact of defects on these thermal fluctuations. The main results of my thesis were published in Nature Physics, Nano Letters, 2D Materials and Carbon, and recognized by UAM patent.

At the beginning of 2017, I started working as a postdoctoral research associate at the University of Manchester under the supervision of Prof. Irina Grigorieva and the Nobel Prize Prof. Kostantin Novoselov. My project was about the study of nanoscopic ripples on 2D materials and the intercalation of metals in a layered topological insulator to achieve topological superconductivity. The main results of this period are published in Advanced Materials and ACS Nano.

In summer of 2018 I moved to the Free University of Berlin to work in Bolotin lab, where I obtained a Humboldt fellowship and studied the influence of a strain gradient on the response of excitons in 2D materials (transition metal dichalcogenides). The main results of this period are published in 2D Materials.

In 2019 I obtained a Juan de la Cierva Formación Fellowship to work at the Instituto de Ciencia de Materiales de Madrid where I studied strain engineering of magnetic 2D materials and thermoelectric effects on magnetic heterostructures. During this period, I supervised two Master thesis and obtained a project (10000$) from the IEEE magnetics society as CoIP. The results of this period were published in Nano Materials Science, ACS Applied Energy Materials and ACS Nano,

In 2022 I started a Juan de la Cierva Incorporación at the UAM, declined in September in favour of a Profesor Ayudante Dr position at the same institution. I am combining my expertise in thermoelectric effects and two-dimensional materials to study their Seebeck and Nernst responses. In collaboration with F. Zamora's chemistry group, we are using liquid-phase exfoliated 2D materials to integrate these technologies into real devices.

I have recently been awarded a national coordinated project in which I am co-IP of one of the subgroups (235.000€). The project has an associated predoctoral contract that has allowed us to hire a PhD student to work in our team under my supervision and that of Julio Gomez-Herrero. In recent years, I have been involved in a project on the manipulation of metallic nanowires for the fabrication of nanocircuits. In addition, due to my extensive experience in the fabrication of 2D samples (heterostructures, suspended samples, bilayers with moiré, etc.), I prepare samples and devices for several groups at the UAM and also for E. Meyer's group in Switzerland.

The results of the research performed during these years are published ACS Applied electronic materials, Nano Letters and Laser & Photonics Reviews During my career I acquired a great expertise in Scanning Probe Microscopies (SPM); I have used by myself a
 broad variety of characterization techniques: Superconducting Quantum Interference Device (SQUID), Scanning Electron Microscopy (SEM), Raman Spectroscopy, X-ray Diffraction (XRD) and Energy-Dispersive X-ray Spectroscopy (EDS). Also I acquired expertise in device fabrication techniques: optical lithography, Reactive Ion Etching (RIE), metal deposition, transfer of 2D materials. The main part of the characterization and fabrication techniques were carried out on cleanroom

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| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
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| **Título:** | Nonequilibrium Neural Computation |

**Resumen de la Memoria:**

During my trajectory, I have defined a transdisciplinary and differentiated research line, developing novel and highly-specialized methods and theory to directly impact current ideas in artificial intelligence and neuroscience. My track record shows a markedly ascending trend in terms of publication impact. During the last three years, my research contributions have been published in top, well-respected journals in my area (e.g. Nature Communications, Neural Networks, Physics of Life Reviews, Behavioral and Brain Sciences). My scientific productivity comprises an interdisciplinary track-record with 18 articles in top, well-respected journals (e.g. 6 first-decile [33%, all as first author] and 15 first-quartile [83%]), 19 proceedings in recognized interdisciplinary conferences in my field (e.g. Neural Information Processing, Artificial Life), and 5 book chapters. My publications have received 1205 citations and a h-index of 14 (Google Scholar). In addition, it should be highlighted that in most of my high-impact contributions I have been the leading author, each with different collaborators from different fields (computational neuroscience, machine learning, physics, cognitive science). This has improved both my own CV, and often my collaborators' research track as well, showing that these interactions and our combined capacities have resulted in a significant qualitative increase of our research potential.

My research line is guided by the ambition of using methods from different branches of complex systems and related areas (information theory, nonequilibrium statistical mechanics, machine learning and nonlinear dynamics) to study closed-loop interaction of biological and neural systems with their environments. The main innovation behind my research is two-fold: 1) I have developed of methods from nonequilibrium statistical physics to study biological and neural systems in interaction with their environment as open, out-of-equilibrium systems (which often challenge assumptions at asymptotic equilibrium), and 2) I have applied such methods to open problems and theoretical challenges within leading theories in neuroscience, machine learning and biophysics.

**Resumen del Currículum Vitae:**

Scientific output. My research has resulted in high-impact outputs, reaching a level of maturity reflected in a marked increase of the profile of my publications in the last three years. My scientific production comprises an interdisciplinary track record with 18 articles in top, well-respected journals (e.g. 6 first-decile, 15 first-quartile and 16 as lead author), 19 conference proceedings and 5 book chapters. My publications have received 1208 citations and an h-index of 14 (Google Scholar). This work comprises my original ideas developed in international collaboration networks that I have established, demonstrating my ability to design, implement and disseminate research activities in an autonomous manner.

Leadership. I am an Ikerbasque Research Fellow (5-year, tenure track research position) at the Basque Center of Applied Mathematics (Spain). I have been awarded a La Caixa Junior Leader – Incoming Fellowship, funded by "la Caixa" Foundation with €305.100, for developing a PI role for three years. My application was selected 1st out of 10 in the first evaluation round (Mathematics, Computer Sciences and IT subpanel) and 2nd out of 14 in the second round (Mathematics, Physics and Engineering panel). I have also obtained funding as principal investigator of an international research consortium (John Templeton Foundation, $150,543) and a regional industrial consortium (ELKARTEK, €70,289.04, see Transfer). Previously, I led a Marie Sklodowska Curie Individual Fellowship at the University of Sussex, UK (European Commission, €212.934), receiving an evaluation of 99/100 (1st percentile among 856 applications in the panel ST-ENG, acceptance rate 13.04%). The quality and maturity in my trajectory has been recognized by an I3 Certificate by the Spanish State Research Agency.

Internationalization. I have postdoctoral experience at the University of Sussex as a Marie Sklodowska Curie Individual Fellow (Sussex Neuroscience and School of Engineering and Informatics, UK). My research mobility is also reflected in international research visits (totalling 9 months) at the University of Tokyo (Japan, Sosuke Ito & Takashi Ikegami), Kyoto University (Japan, Hideaki Shimazaki), the University of Sussex (UK, Chris Buckley), University of Valparaíso (Chile, Patricio Orio), Indiana University (US, Randall Beer), resulting in an extended collaboration network, as evidenced by my publication track.

**Resumen de la Memoria:**

Dr. Iñigo Urteaga Aldasoro develops novel methodology for probabilistic, mechanistic and deep machine learning for real-life applications.

He is currently working on disentangling data missingness patterns from time-varying signals, by accommodating irregular and noisy sampling via continuous-time dynamical systems in data-driven predictive models. The overarching questions are (i) how to analyze the time-varying nature of real-world phenomena, and (ii) how to analyze observed data subject to missing not-at-random patterns. These questions are addressed by studying the theoretical and practical aspects of statistical machine learning. Precisely, he develops statistical machine learning that blends mechanistic and data-driven techniques, and devises novel and efficient Bayesian (Monte Carlo and Variational) inference techniques for such probabilistic, deep and hybrid generative models.

He is also contributing to the development of sequential decision making algorithms under non-stationarity and model uncertainty, with applications in industry and beyond. As Co-PI of a recently awarded NSF project, he directs and supervises research on human-aligned reinforcement learning (RL). Namely, on how to learn RL-based dialog structures that balance optimal collection of information, with intuitiveness and logical conversational structures as perceived by humans. The aim is to generate human-understandable explanations of RL inferences and recommendations, contributing to human-centered and explainable machine learning, an active research area of broader impact.

Dr. Urteaga's overarching research goal is to learn from real-world data: i.e., to build statistical machine learning techniques that extract information from data, by developing robust and efficient computational tools for inference, prediction and control. As an applied statistician and machine learning researcher, he is passionate about the study of statistical models and algorithms for computer systems to effectively learn ---from data, without explicit instructions--- how to perform real-life tasks. To that end, Dr. Urteaga combines probabilistic and mechanistic models with deep and statistical learning to disentangle, assisted by approximate inference techniques, information from spurious signals. He investigates the theoretical and practical aspects of data-driven statistical learning, for descriptive, predictive and prescriptive tasks in scientific, engineering and medical domains.

**Resumen del Currículum Vitae:**

Iñigo Urteaga Aldasoro is a young, internationally recognized Ikerbasque Research Fellow developing advanced statistical machine learning for their application in a wide range of disciplines. With a Master's in Telecommunication Engineering by the UPV-EHU in 2008, his return to Spain was enabled by the Ikerbasque Research Fellowship awarded to him in December 2022. His research is currently funded by LaCaixa's 2022 Junior Leader Incoming project, and a recently awarded US National Science Foundation (NSF) grant.

Dr. Urteaga attained his Ph.D. in Electrical Engineering in 2016 at Stony Brook University (SBU), NY, USA, with several awards and scientific recognitions (the 2016 Armstrong Memorial Research Foundation). His doctoral work was complemented by extensive teaching and mentoring experience, and he was actively involved in SBU's Engineering Summer Camp, where he was an instructor and mentor for high-school students interested in science, engineering and mathematics careers. Dr. Urteaga flourished while at his postdoctoral appointment at Columbia University, NY, USA (2016-2018), with several recognized contributions in the field of statistical modeling for mobile health data and machine learning for healthcare (2021 STAT Wunderking).

Prior to joining BCAM, he was an Associate Research Scientist at Columbia University, affiliated with its Data Science Institute, where he performed cutting-edge research in collaboration with Columbia faculty. He was Principal Investigator in a research project with eBay Inc., and Co-Investigator in a US National Institute of Health (NIH) project. In the former, he served as the scientific leader of a team of 4 data scientists to research online Bayesian optimization solutions for efficient pre-training of Transformer-based language models. In the NIH project, he was the lead investigator on two of its research aims, and the team's expert on Bayesian statistical learning and reinforcement learning. He was not only responsible for the scientific advancement of these projects, but also for the supervision and mentoring of Ph.D., Masters' and undergraduate students across several Columbia University departments. At Columbia University, he was a guest lecturer in several data science, applied mathematics and biomedical informatics graduate courses.

Dr. Urteaga is an active member of his professional community, as he is involved in editorial boards of first-class journals (e.g., JMLR editorial board) and international conferences (MLHC Program Chair, ACML area chair, ICML, NeurIPS, AISTATS top reviewer), in several PhD committees, and as evaluator of international research proposals (US, Canada). Dr. Urteaga is actively engaged in technology transfer (Math-In, BAIC), outreach, and dissemination activities: from encouraging high-school students to embark in STEM careers, to discussing machine learning opportunities with young data scientists. He has participated in several science dissemination activities in Bilbao, at the Basque public radio science program, the New York Academy of Sciences, and Columbia's Data Science Institute.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | MARTÍNEZ SOLÍS, DIEGO |
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| **Correo Electrónico:** | dmartinezsolis@gmail.com |
| **Título:** | STUDY OF THE PHYSICAL PHENOMENA AND TECHNOLOGICAL APPLICATIONS OF SPACETIME INTERFACES |

**Resumen de la Memoria:**

The applicant's research career has so far been two-faceted: on the one hand, his pre-doctoral stage was—setting aside his full-time period in the embedded electronics industry—mainly focused on computational electromagnetics, surface integral equations and supercomputing; on the other hand, the applications of such endeavors started to steer away from microwave engineering towards more science-oriented (as opposed to technology-oriented) nano-scale light-matter interaction and plasmonic-assisted spectroscopy (the results of whose work led to many collaborations with prominent figures in the physics/physical chemistry communities, materialized in numerous high-impact publications), which planted the seed of pursuing more fundamental and theoretical, though equally-valuable, aspects of research in electromagnetics. Accordingly, the applicant spent more than 5 years working for (and is still closely collaborating with) Prof. Engheta and, to a lesser extent, Prof. Alù, both very prominent figures in virtually every theoretical aspect of electrodynamics that one could think of, and with whom the applicant got in touch among other things with exotic propagation modes, metasurfaces, nonlinear optics and, preeminently, the fascinating world of non-stationary electromagnetics, which is the pivotal concept of this proposal and currently the hottest topic in the metamaterial community. The key idea boils down to extending the degree of wave manipulation supported by "conventional" artificial metamaterials by adding an extra knob: the temporal variation of the constitutive parameters has the ability to lift many of the usual physical bounds and allow for new exotic wave phenomena. Consequently, we now have permittivities, conductivities,…that live in a spacetime manifold. And things become even more interesting under the realization that these dynamic variations can take place by either modulations (synthetic motion, e.g. electro-optically induced, which can be superluminal) or true motion involving Fresnel drag. Now, considering that much of the interesting physics happens at the interfaces with the bulk, the objectives of this project are (i) the analytical and numerical study of the physics underpinning spacetime interfaces and (ii) the identification of technological applications; hence the title "STUDY OF THE PHYSICAL PHENOMENA AND TECHNOLOGICAL APPLICATIONS OF SPACETIME INTERFACES". The planned research lines include: the modeling of wave propagation in periodically time-modulated dispersive materials, the description of the physics of synthetic/actual moving interfaces (including time nonlocality), the frequency and electromechanical energy conversion from waveguides or cavities with moving/switched walls, or the study of time-modulated metasurfaces and Moiré structures (e.g. graphene).

**Resumen del Currículum Vitae:**

Diego Martínez Solís holds since 2022 a Maria Zambrano position at the Department
of Tecnología de Computadores y Comunicaciones, Univ. of Extremadura (UEx).
His research interests include computational electromagnetics (finite differences, finite
elements, surface integral equations, method of moments, fast multipole methods, domain
decomposition methods, high-performance computing), and numerous aspects of photonics
(plasmonics, spectroscopic biosensing, nonlinear optics, electron band theory, photonic
crystals, epsilon-near-zero, nonreciprocal devices, phase conjugation, cathodoluminescence)
and metamaterials/metasurfaces, particularly the fascinating world of time-varying media and
relativity.
After obtaining his MSc in Electric Engineering at the Univ. of Vigo in 2007 (thesis carried
out at Technical Univ. of Denmark), he worked for more than 3 years in the automotive
electronics industry as an embedded systems programmer. In 2011, he started his PhD in
computational electromagnetics at the same university and graduated in 2014 with honors with
international mention, for which he received a "Premio Extraordinario de Doctorado". Over the
course of this pre-doctoral period he was a visiting scholar at the ElectroScience Lab (Ohio
State Univ.) and at the Department of Electronics and Telecommunications (Politecnico
di Torino).
In 2016 he received a Xunta de Galicia post-doctoral grant that took him over a 2-year period
to the Department of Electrical and Systems Engineering (Univ. Pennsylvania), and
the Department of Electrical and Computer Engineering (Univ. Texas at Austin), where
his research interests broadened from computational electromagnetics towards photonics and
metamaterials. In 2018, he started a post-doctoral fellowship at the UPenn
in order to do research on nonlinear optics and time-varying metamaterials in Prof. Nader
Engheta's group, under a DARPA and a Vannevar Bush Faculty Fellowship (VBFF) program,
respectively.
To date, Solís has co-authored 44 JCR peer-reviewed journal publications (31 of those Q1),
22 as 1st/2nd author, including (besides numerous manuscripts in the IEEE Trans. Antennas
Propag.) high-impact journals such as Science, Nature Communications, PNAS, ACS Nano,
Physical Review, Advanced Optical Materials, Laser & Photonics Reviews, Angewandte
Chemie or ACS Photonics (making it to the cover in the latter two). He has also co-authored
chapters in 2 IET books and 59 conference contributions (most of them international, and many
of them by invitation), receiving the INDRA best paper award in VLO (very low observability)

technologies in URSI2023-Cáceres. He currently has 7 manuscripts under review. According to Scopus (Google Scholar), his work has 1605 (1994) cites and an average per-year citation number of 222 (277) over the last 5 years, for a total h-index of 19 (22). Since 2022 he has lectured 18 ECTS credits of BSc/MSc theory courses at UEx (12 of them as MSc course coordinator), and has directed 2 MSc and 3 BSc theses, with honors. He is currently directing 2 PhD's, and also 2 undergrad theses. Through the NATO-cleared spin-off EM3WORKS, he has just signed with INDRA, as single PI and intellectual author, a several-hundred-thousand project on VLO windows for electro-optical systems under the umbrella of the EU-funded program "Next Generation Weapon System / Future Combat Air System (NGWS/FCAS)".

| **Área Temática:** | **Tecnologías de la información y de las comunicaciones** |
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| **Título:** | Deep learning models for neuroimaging biomarkers |

**Resumen de la Memoria:**

I started my research career during my undergraduate studies on computer science through my involvement in a research project focusing on the rehabilitation of multiple sclerosis patients through the use of interactive computer games targeting specific areas of cognition (memory, language, etc.) with different levels of difficulty depending on their disability. This initial internship in the VICOROB research group has led me on a research path that serves as a bridge between cutting edge image analysis techniques and medical research based on image findings. Consequently, during my career I have been involved with multiple interdisciplinary teams and projects that have lead to a varied list of research topics, mostly focusing on medical imaging analysis for neurological disorders. Furthermore, I have worked in diverse groups ranging from computer vision-centric research teams (VICOROB in Spain and LTS5 in Lausanne), to clinically-focused groups (Hospital Vall d' Hebron in Spain) and even industry focused projects (SNAC in Sydney). That has motivated different short and long research stays that have served to establish ongoing national and international collaborations with medical experts on different neurodegenerative disorders (multiple sclerosis, motor-neuron disease, tremor disorders such as Parkinson's disease, dementia or epillepsy).

For all these projects, my main area of interest has been the development of automatic image analysis using the latest development in machine learning and artificial intelligence. Since 2015, my work has specifically focused on the development of deep learning models for a range of different tasks relevant for medical imaging including image segmentation, image classification, image synthesis and pre-processing, image registration and recently learning paradigms such as federated learning and incremental learning to improve collaboration between multiple centres in a secure, ethical, efficient and private manner. However, thanks to my current position at the University of Sydney, my role as a member of the leadership group of the Sydney Clinical Imaging Network, and the relationships I established during my post-doctoral career in Spain, I have been able to start new lines of research focusing on image analysis on new topics including fetal ultrasound imaging and drone-acquired images for forestry applications. My expertise on common problems on magnetic resonance imaging (lack of annotated data, differences in acquisition protocol, heavy imbalances between classes, etc.) have proven beneficial when working on these new topics.

**Resumen del Currículum Vitae:**

Since the start of my career, I have worked in the development of tools for the analysis of medical imaging with a special focus on brain magnetic resonance and neurodegenerative diseases. I have published 78 papers (38 in the past 5 years, 19 as a first or last author; 62 on original research and 3 review papers); with a total of 4466 cites (Google Scholar). 30 of these publications have been published on high impact JCR journals (Q1 and Q2) with 75.9% of all my publications accepted in the top 25% most cited journals (SCimago), including NeuroImage, the first journal in neuroimaging, Medical Image Analysis, and the American Journal of Neuroradiology. Furthermore, all the tools resulting from these publications have been made available either through my personal github page, my collaborator' s personal repositories or Docker containers to ease their use for the neuroscience community. I have h-indices of 19 (Scopus), 18 (Web of Science), and 24 (Google Scholar), which are very strong for a medical image analysis researcher at my career stage and an average number of 46.16 (Scopus), 29.31 (Web of Science) and 51.93 (Google Scholar) cites per publication. Furthermore, my impact is further exemplified by my field-weighted citation impact (Scopus) of 2.26 (FoR 3209 - Neurosciences) and 2.27 (FoR 40 - Engineering). This measure of citations relative to world average in a field means that I have more than double the world average citations for neuroscience and engineering.

To further the societal impact of my research, I have established collaborations with companies specialising in medical image solutions (OLEA, Icometrix, NeuroQuant) and hospitals (Spain and Australia) and my licensed work has served as the basis for the foundation of a startup company focusing on multiple sclerosis (TensorMedical). Moreover, my current position at the University of Sydney serves as a bridge with industry thanks to my involvement in Australian projects on translational research with the Sydney Neuroimaging Analysis Centre (SNAC). Nonetheless, I have also established research collaborations with international researchers in multiple countries (Switzerland, Germany and Japan, amongst others), I have participated in peer-review and editorial duties (as a guest and associate editor) for multiple journals and conferences (obtaining outstanding reviewer awards in some cases), and I have been part of the organisation and program committee (chair) of international conferences. Futhermore, I have always been committed to open research and making the results of my studies, when possible, publicly available to the community. That pursuit for transparency and availability has also translated to my participation in several public challenges promoting publicly available data with the aim of improving the reproducibility of our results.

When it comes to supervision, I have always focused on mentoring younger research students (undergraduates, Master' s, Honour' s, PhD and research internships) throughout my whole research career and motivate them to become future rising stars. Most of these students (from the MAIA Erasmus-Mundus program) are currently either pursuing their PhD or working with industry in prestigious European companies (Icometrix and NeuroQuant). Finally, I have established an interdisciplnary team of research students in Sydney to focus on brain imaging.

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| **Área Temática:** | Tecnologías de la información y de las comunicaciones |
| **Nombre:** | DUTTA , BAPI |
| **Referencia:** | RYC2023-045020-I |
| **Correo Electrónico:** | bdutta@ujaen.es |
| **Título:** | FAIRDECISION: Exploring new formulations for Fairness in intelligent decision-making |

**Resumen de la Memoria:**

His research track under the theme of Navigating Complexity through Operations Research and Computational Intelligence (NCORCI), focuses on developing operations research and computational intelligence tools and applying them in solving complex real-world problems originating from public and private entities. The set of advanced computational intelligence and operations research tools includes information fusion (aggregation operators), epistemic uncertainty modeling, multi-attribute (group) decision-making, group consensus modeling, single objective and multiobjective optimization (classical and metaheuristic), integer and mixed integer programming, discrete event and agent-based simulation, and machine learning. The application domains extended to industrial engineering, healthcare, strategic decision-making, and evaluation of complex system performance.

Dr. Dutta's PhD thesis is composed of 6 JCR indexed journal papers in the direction of his research theme. This thesis is devoted to exploring the applicability of fuzzy sets-based linguistic frameworks in developing decision-making schemes for solving real-life decision problems under epistemic uncertain environments. It particularly focused on developing different CI and OR tools and techniques for processing linguistic information characterized by different types of fuzzy sets and implementing them in designing decision-making schemes for solving real-life decision-making problems. The key research line that emerged from the thesis is the aggregation of heterogeneously related information in the decision-making process. Two proposals were made to capture the different patterns of such heterogeneous interrelationships among the aggregated inputs in the information fusion process via composite aggregation function.

Dr. Dutta, post-PhD, enhanced aggregation function modeling, generalization, and learning, reflected in JCR-indexed publications. Beyond PhD research, Dr. Dutta started working on improving classic OR tools multi-criteria decision-making, specifically the robustness issue in the recommendation and management of uncertainty in such models, and collaborating with renowned researchers yielding noteworthy JCR-indexed results. This research area is still extremely active for crucial decision-making, like SDGs, policy-making, and strategic decisions emphasizing robustness.

During the short research stay in the SINBAD2 group at the University of Jaen, Dr. Dutta introduced mixed OR and CI-based research lines, large-scale group decision-making, especially the minimum cost-based consensus. After joining the group, he has been actively working in this area as well as a fuzzy linguistic approach to group decision-making, mainly, computing with words and consensus-reaching processes and applying them to real-world problems. The interesting results are reflected in his publication list.

At the moment, there is still ongoing research to be done related to the above lines, and the mid-term line schedule is already planned. Dr Dutta is dealing with data-driven large-scale group decision-making problems in which opinionated information regarding the problem is collected from internet space and ethical concerns in complex group decision-making systems through the perspective of fairness.

**Resumen del Currículum Vitae:**

Currently, Dr. Dutta is working at the University of Jaen since May 2022 as a junior postdoctoral researcher supported by Grants for the Requalification of the Spanish University System for 2021-2023 in the María Zambrano modality (UJA13MZ). He belongs to the research group Intelligent Systems based on Fuzzy Decision Analysis (TIC 206) and works in data-driven decision-making, computation with words, simulation, optimization, and machine learning. He completed his Ph.D. in Mathematics from the Indian Institute of Technology, Patna, India. After his doctoral stint in India, he joined The Logistics Institute- Asia Pacific, National University of Singapore as a postdoctoral researcher and worked as a key team member of a multi-disciplinary research team, which aimed to address logistics and operational planning problems faced by a public and private entity in Singapore and other south Asian countries in the face of disruptive technologies.

He has published 34 articles in JCR journals, 21 of them in Q1 (in 13 he is the first or second author) with collaborators from 10 different countries. He has an H-index of 13 with 600 citations according to ISI-WOK (575 without self-citations) (Google Scholar: citations 888 with H-index 17). He is the associate editor of the International Journal of Intelligent & Fuzzy Systems and a reviewer of the more than 15 journals indexed in JCR. He was the organizing committee member of 95th EWG-MCDM 2023 and International Workshop on Artificial Intelligence and Analytics - Eureka 2023 and also delivered a webinar on Prescriptive Analytics for Decision-making using Fuzzy Logic in Eureka-2023. He is also organizing a special session at an international conference, FLINS-ISKE-2024. He was the PhD tribunal secretary of Dr. Wen He, a PhD student from the University of Jaen.

He has collaborated as an investigator/lead researcher/PI in 7 projects, one academic project from the Indian Government R&D agency, 3 practical projects related to the operational planning/efficiency improvements from the Singapore Government's R&D wings and multi-national companies (P&G, Marina Bay Sands) with budgets of 79.696€, 1.417.964€ and 689.164€, and 4 technological/merit transfer projects from the Singaporean company ST Logistics, NLB, Singapore and MGS INGENIERÍA INFORMÁTICA, S.L,Spain. Except for the academic project, the results of the rest have been implemented by the industry partner or attached public entity associated with the projects. Currently, he is involved as an investigator in HORIZON Innovation Actions for the Horizon Europe project (Id:101136139 —entitled: CRETE VALLEY).

During his postdoctoral stint in Singapore, he engaged in training 3 junior research staff (Masters student) Jingyi Chen, Amirullah Yunis and Peiji Cong of the lab in Simulation tools (Simio, AnyLogic), Optimization and Analytics. He has also co-supervised the PhD students: Swati Rani Hait (IIT KGP) and Debashmita Baneerjee (IIT Patna) with his PhD supervisor Dr. Debashree Guha. They have successfully defended their theses in 2022, respectively, and three results are published in JJCR-indexedQ1 journals that are reflected in Dr. Dutta' s publication list. they are working as post-docs in India. Currently, he is mentoring two international PhD students (Yefan Han and HuiHui Song) from China at the University of Jaen.