



AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2018

Turno de acceso general

Nombre: RAMIREZ REINA, TOMAS
Referencia: RYC2018-024387-I
Área Temática: Energía y transporte
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Título:

Design of Advanced Catalysts for Low Carbon Energy Processes

Resumen de la Memoria:

The research career of the candidate, represents a highly innovative contribution to the scientific fields of Energy, Catalysis and Nanomaterials. Among the different research topics that the candidate has tackled during his career, his main research line has been the design of advanced catalysts for energy and environmental applications. This includes:

- clean hydrogen production
- microchannel reactors for process intensification
- hydrocarbons upgrading
- engineered membranes for advanced carbon capture processes
- biomass valorisation: waste to fuels
- chemical CO₂ recycling

The overriding aim has been the development of multifunctional and highly effective catalysts for the processes mentioned above. In order to accomplish this target the candidate has developed a wide variety of advanced nanocatalysts based on noble metals, transition metals, ceramic oxides, carbon based materials, metallic micromonoliths, core/yolk-shell structures, etc.

The research lines of the candidate have been carried out thanks to the development of an extended network of collaborative research in UK, Spain, China, Russia, Latin America and Europe reflecting the multidisciplinary aspect of his research career, which has led to successful joint funding applications and a number of scientific contributions, as manifested in the enclosed CV.

Resumen del Currículum Vitae:

Dr Tomas Ramirez Reina is a Senior Lecturer in Chemical Engineering and the Head of the Catalysis Unit at the University of Surrey. He holds a PhD in Chemistry with a strong background in heterogeneous catalysis, reaction engineering and material and energy sciences. His research in catalysis has been recognized by the international community with multiple awards, including the EFCATS award in 2013, the Spanish Society of Catalysis award in 2014, the extraordinary PhD award by the University of Seville 2015, the Young Scientist of the Year 2017 by Seville city council and the Royal Academy of Sciences / Royal Cavalry Armory of Seville 2018. He has been also finalist of the prestigious IChemE awards in 2016 and 2017 in the category of Young Academic Researcher ranking Tomas among the top-10 young researchers in chemical engineering. He has co-authored 60+ peer-review publications in high impact factor journals (including for example Chemical Reviews I.F: 52.6), 5 book chapters and has licensed 4 industrial patents. Dr Reina has successfully supervised 13 MSc and 1 PhD project and he is presently co-supervising 6 PhD students and 2 postdoctoral researchers. Currently he is the PI of several projects in the area of energy and sustainable chemical technologies sponsored by multiple institutions such as EPSRC, Royal Society, British Council and Chinese Academy of Science. He has secured as Principal Investigator around 0.5m in different competitive research grants.



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Nombre: WOODCOCK , JAMES
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Área Temática: Energía y transporte
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Título:

Global and Local Health Impact Assessment of Transport

Resumen de la Memoria:

Transport is a major contributor to determinants of population health. Adverse health impacts are greatest in rapidly urbanising and motorising lower- and middle-income country cities. In 2016 there were an estimated 1,3 million road traffic deaths, 4,3 million deaths from outdoor air pollution, and 1,4 million from low physical activity. Road transport produces around 17% of energy related greenhouse gas emissions, and this is rising. Transport systems need to shift away from the car towards more active and sustainable modes. Many cities are investing in policies to support walking, cycling (including electric assist bikes), and transit. Making the wrong decisions comes with high costs.

To support these decisions simulation models have been developed in which data on travel patterns and related exposures are used to calculate health outcomes from changes or contrasts in travel-related exposures. My work helped create and remains at the forefront of this emerging field.

These kind of simulation models are a form of evidence synthesis, they allow us to bring together the best evidence and expert opinion to answer questions that no single empirical study can. However, the current generation of models has significant limitations. Previous studies have used heterogeneous scenarios, data, and methods. Crucially we do not sufficiently understand the implications of this heterogeneity. Results are needed for settings with limited data (typically lower income settings with the greatest need). To achieve this, we need to utilise new and emerging big data and apply data science methods (e.g. machine learning of image data) to consistently estimate travel behaviours and health exposures at scale. We need dialogue, and where possible to integrate models, with the separate discipline of transport modelling.

To address these limitations, I will develop the next generation of transport and health impact models and tools that are academically robust and practically useful. The need to better integrate health evidence with transport research and decision-making is a major research gap and opportunity.

In my position at ISGlobal I will complete the following objectives:

1. Develop methods and computer programs that allow researchers to compare health impact models and data. By collating and comparing models across many settings and scenarios I will identify the circumstances in which variation in model structure and parameters makes an important difference to model results. This information will be used to create and test models for new settings and problems.
2. Integrate health impact modelling methods with the models used by transport researchers. This will make health impacts visible to transport planners. I will investigate the added value that land use/transport models can bring to health impact modelling from improved spatial and temporal detail and following households' residential location over time.
3. Use the methods from (1) and findings from (1) and (2) to work towards developing a global city-level model and tool that utilises the best data available in any setting to create comparable exposure and disease estimates. Initially this will be based on archetypical cities for world regions.

Resumen del Currículum Vitae:

Since getting my PhD in 2010 I rapidly became an independent researcher and then a research leader, quickly achieving senior researcher grade and recently principal research associate (equivalent to Reader or Profesor Titular de Universidad) at a leading global university. I now manage a team of 1 senior researcher, 3 post docs, 1 computer scientist, and 1 PhD student.

My work has been cited over 5000 times, with H index 25, i10 index 32. https://scholar.google.co.uk/citations?hl=en&user=4n5VJBIAAA&view_op=list_works&sortby=pubdate. I have 6 research articles in The Lancet (2 as first, 1 as second, and 1 senior), 1 in the BMJ (1st author), and 2 in PLOS Medicine (1st and senior author). I also publish in transport and injury journals. I am increasingly senior author, with 20 articles as senior/ joint senior.

I am regularly called on to advise national, European, and international bodies and to give international invited talks.



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I work in a multidisciplinary manner and have secured funding across disciplinary boundaries.

I have secured funding from the European Research Council: I have recently been awarded a highly competitive European Research Council Consolidator Award for 2 million (starting April 2019). The project will be developing the next generation of transport and health impact models

Previously I have secured funding from the UK research councils: I am principal investigator on two on-going UK research council awards and have previously led one grant and one fellowship. The two current projects give me experience of managing a team (currently 5 post-doctoral researchers and senior researchers) and co-ordinating an international collaboration with partners in India, Brazil, Peru, USA and other leading UK universities.

In addition I have received over 0,6 million for policy research (including UK Department for Transport and Public Health England). As co-investigator I have been part of major awards for projects, programmes, and centres (see grants section).

I created the Integrated Transport and Health Impact Modelling (ITHIM) tool. ITHIM is extensively used in research, policy, and planning. Contributors are from across the USA and Canada, and Europe. ITHIM has a user community of over 150 people from 12 countries. Recently there has been user testing by the WHO in Medellin, Colombia; and in Accra, Ghana

I have led the development of policy models most notably (1) The open source Propensity to Cycle Tool www.pct.bike, funded by UK Department for Transport, is recommended in appraisal guidance. (2) The Health Checks model funded by Public Health England is used to assess the health impacts of the cardiovascular screening programme.

My work has been at forefront of developing new methods for modelling transport and health, and linking to environment sustainability. For example I led the seminal study 2009 Lancet paper on climate change mitigation and health. Many studies by different groups have followed this work but I have remained at the forefront of developing new methods (e.g. physical activity and traffic injury risk), using new and emerging big data sets (e.g. Google street view). Perhaps most importantly while most research has been limited to high income settings I have done studies in India, Africa, Latin America, and Malaysia.



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Nombre: HARO REMON, MARTA
Referencia: RYC2018-025222-I
Área Temática: Energía y transporte
Correo Electrónico: mharo79@gmail.com

Título:

Solar Rechargeable Batteries for Electric Transport (SoRBET)

Resumen de la Memoria:

My 15 years as a working scientist includes research in photoelectrochemistry, electrochemistry and nanoscience. Nanoscience research has been highly useful in the optimisation of (photo)electrodes via the design of nanostructured thin films for use in energy and environmental sustainability applications. My research in photoelectrochemistry focused tuning the material composition and nanostructure of photoelectrodes. By engineering these properties, I aim to increase the charge conversion and manipulate the electrochemical reaction pathway. My electrochemical research is focused on energy storage including mechanisms, kinetics and device assembly. Within this work, I was able to design nanostructured electrodes which maximised the energy/power density and mechanical stability. My work in photoelectrochemistry, electrochemistry and nanoscience converge in Solar Rechargeable Electric Transport (SoRBET) research.

Staff Scientist in Nanoparticles by Design Unit at OIST (Japan) since 2016.

New nanostructured Si anodes using nanoparticles with improved electrochemical performance and mechanical stability Li-Ion Batteries

Studied of lithiation process in nanoparticles by in-situ KP-AFM

This work resulted in a publication in Advanced Science, one submitted, one in preparation and a book chapter

Postdoctoral Researcher in Group of Photovoltaic and Optoelectronic Devices (GDFO) at University Jaume I (Spain) from 2013 to 2015

Developed new photoelectrodes based on organic materials for solar fuel generation

Harvested oxide materials for photoelectrodes in solar water splitting

Designed a pseudocapacitive device Sun charged

Proposed new equivalent circuit models for electrodes in Li batteries

This work resulted in 15 publications and I worked in a European project.

Postdoctoral Researcher in the Group of Adsorption and Environmental Protection on Porous Solids (ADPOR) at National Institute of Carbon (Spain) from 2010 to 2013

Demonstrated carbon-mediated photoinduced reactions in Advanced Oxidative Processes

Synthesized and characterized porous solids for environmental protection

Removed ions and polyaromatic hydrocarbons from water by adsorption and electrochemical phenomena

This work resulted in 11 publications and a book chapter. I was also participating in a project with the company ACCIONA Infraestructuras

Postdoctoral Researcher, in Organophotonics Group at the University of Hull (UK) from 2008 to 2010

Evaluated the redox potential of the studied molecules for photoelectronic devices

Developed a home-made electrochemical modulation spectroscopy device

This work resulted in 2 publications

Assistant Professor (2006-2008) and Predoctoral Researcher (2003-2006), in the research group PLATON in the Department of Physical Chemistry at the University of Zaragoza (Spain)

Teach practice labs and theoretical subject

Designed bottom-up thin films in structures to enhance electrochemical and optical response

Determined thermophysical properties of liquid mixtures with interest in chemical engineering

The work performed in the research group PLATON resulted in 32 publications (2 during my short stay at the University of Windsor in Canada)

Resumen del Currículum Vitae:

EDUCATION

Bachelor s degree in chemistry, University of Zaragoza in 2002

PhD degree in Physical Chemistry by the University of Zaragoza in 2007



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CURRENT PROFESSIONAL POSITION

Staff Scientist in OIST (Japan) with 10 + years of post-PhD experience

COMPETITIVE FELLOWSHIPS

JAE-Doc fellowship, Spanish Govern to cover 3-year postdoc salary in Spain
Postdoctoral Fellowship, Spanish Govern to cover 2-year postdoc salary in UK
FPU-Training programme for academic staff to cover 4-year PhD salary and study costs
Predoctoral FPU mobility for a research stay in Canada
CAI European programme for abroad research stays for a research stay in UK

FUNDED PROJECTS

1 Participation in Industry project with ACCIONA Infraestructuras to improve indoor quality air
1 Participation in European Project
9 Participation in national projects
1 Principal investigator in Japanese project

PUBLICATIONS IN ISI JOURNALS

Publications: 61 (2 corresponding author)
Citations: 916 (source: Scopus 29/01/2019)
h-index: 17 (source: Scopus 29/01/2019)
1 Journal Cover in Advanced Science (IF = 12.441)

OTHER KIND OF PUBLICATIONS

Book chapters: 2
Conference communications: 36
Publications in non-ISI journals: 2

COLLABORATIONS

Collaborations with companies (ENI, Abengo, Nanoquimia)
International research groups (e.g. South Korea, Japan, Mexico, Argentina, Italy, Germany)

TEACHING

400+ teaching hours of undergraduate students
Undergraduate course: Electrochemistry. Electrochemical Industry

MENTORING

Supervision of BSc students: 2
Supervision of MSc students: 2
Supervision of PhD students: 1
Supervision of visiting students/researchers: 3