



AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2015

Turno de personas con discapacidad

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Área Científica: Física y Ciencias del Espacio

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Título:

The formation of black holes

Resumen de la Memoria:

CAREER: I joined the CfA in Sep 2003 with a 3-year fellowship. I led as PI a wide range of programs for the discovery and follow-up of X-ray transients. In recognition of the outstanding and breakthrough contributions provided by this work to the high-energy astrophysics community, my fellowship was renewed (from 2006 to 2008) and I obtained a staff position (2008-2010) to continue leading these programs. In 2007 I also joined as co-I the team of prestigious Dr. Jeff McClintock (CfA) with the goal of increasing the number of black-hole X-ray binaries with mass measurements. Later, upon arrival at the SRON I focused on the continuity of the Chandra Galactic Bulge Survey (GBS) and developed, with co-PI Dr. Peter Jonker, another novel survey to study ultraluminous X-ray sources in the infrared. My relevant research achievements, strong observational and technical experience allowed me to obtain an operation staff astronomer position at the European Southern Observatory (ESO). I joined ESO in Jan 2015. Very unfortunately, I was unable to perform all the duties expected at Paranal Observatory due to my low-eye-vision handicap (see page 6), and was hired again by SRON in Nov 2015.

RESEARCH LINE: At present, masses and space velocity measurements for black holes are sorely needed to constrain black hole formation models. Observationally, there has been a strong selection effect towards black hole X-ray binaries that are accessible to optical spectroscopy. To overcome the dearth of mass measurements and observational biases, my research projects aim to measure masses and velocities in an enlarged sample of Galactic and extragalactic black hole X-ray binaries. For this purpose, we are currently increasing the number of known black hole X-ray binaries with dedicated surveys and measuring the above quantities in suitable objects. In this way, we will eventually be able to constrain black hole formation models. Understanding black hole formation and proving the existence of intermediate mass black holes will have a major impact in our knowledge of supernova explosions and the nature of their progenitors, as well as on the formation of super-massive black holes.

Resumen del Currículum Vitae:

I am currently a scientist in the astrophysics group at the Netherlands Institute for Space Research (SRON). Over the years, my research work has been focused on understanding how black holes form. I am seeking the answer to this fundamental question through original surveys and the multi-wavelength studies of black hole X-ray binaries and ultraluminous (extragalactic) X-ray sources. As my Curriculum Vitae shows, I have been able to keep a highly competitive research activity and produce benchmark contributions to the field of black-hole astrophysics despite the limitations imposed by a major visual disability (75% impairment).

I obtained my PhD in Astrophysics in 2004 at the University College in Cork, Ireland, and have moved to several research positions at the CfA in USA, SRON in The Netherlands, and ESO in Chile. At the same time I have held various visiting and associate researcher positions at CfA, Radboud University, IAC, ESO and SRON. In some of these institutions I have actively participated in the co-supervision of PhD and Master students. I have also been very successful, both as PI and as co-I, in raising funds for research projects, totalling nearly 800,000 €.

In total, I have published 84 refereed papers and 93 non-refereed telegrams and circulars, totalling 2357 citations (h-index: 24). I have also carried out community services (up to where my condition allowed me) by participating in time allocation committees and PhD panels, and by acting as referee for main astronomical journals.