

Fecha del CVA	04/04/2023
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Parte A. DATOS PERSONALES

Nombre	Guillermo		
Apellidos	Quintana-Lacaci Martínez		
Sexo	No Contesta	Fecha de Nacimiento	
DNI/NIE/Pasaporte			
URL Web			
Dirección Email	link22@gmail.com		
Open Researcher and Contributor ID (ORCID)	0000-0002-5417-1943		

A.1. Situación profesional actual

Puesto	Doctor Fuera de convenio fijo		
Fecha inicio	2022		
Organismo / Institución	Centro Superior de Investigaciones Científicas		
Departamento / Centro	Astrofísica Molecular / Instituto de Física Fundamental		
País		Teléfono	(+34) 91.704.08.21 - 442432
Palabras clave	Evolución estelar; Radioastronomía; Estrella gigante		

A.2. Situación profesional anterior (incluye interrupciones en la carrera investigadora - indicar meses totales, según texto convocatoria-)

Periodo	Puesto / Institución / País
2020 - 2021	Contratado por obra y servicio Proyecto NANOCOSMOS (G1) / Centro Superior de Investigaciones Científicas (INSTITUTO DE FISICA FUNDAMENTAL)
2015 - 2020	Contratado por obra y servicio proyecto NANOCOSMOS (DFC) / Centro Superior de Investigaciones Científicas (INSTITUTO DE CIENCIAS DE MATERIALES MADRID & INSTITUTO DE FISICA FUNDAMENTAL)
2011 - 2014	Contratado por obra y servicio proyecto Astromol (G1) / Centro Superior de Investigaciones Científicas (Centro de Astrobiología)
2009 - 2011	Bolometer pool Manager, astrónomo / Institut de RadioAstronomie Millimétrique (CNRS-IGN-Max Plank)
2004 - 2008	Becario FPI / Observatorio Astronómico de Madrid
2001 - 2001	Becario en prácticas / Laboratorio de Astrofísica Espacial y Física Fundamental

A.3. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Astrofísica y cosmología	Universidad Autónoma de Madrid	2008
Diploma de estudios avanzados: Especialidad en Astrofísica y cosmología	Universidad Autónoma de Madrid	2006
Licenciado en Ciencias Físicas Especialidad Física Teórica	Universidad Autónoma de Madrid	2004

Parte B. RESUMEN DEL CV

I have published 56 articles in some of the most relevant refereed scientific journals in the field, such as Nature, Nature Astronomy, Astronomy & Astrophysics, and Astrophysical Journal, for which I have also been a referee. I have also been a referee for the journal SCIENCE. I have an h-index of 24. Those papers have a total of 1333 citations, with an average of 83 citations per year over the last 5 years, and 154 last year. I have also participated in 4 technical reports at the IRAM 30m and IGN 40m radiotelescopes.

I regularly collaborate with different international groups in the field of evolved stars, such as those at Chalmers University, the Onsala Space Observatory, Jet Propulsion Laboratory, or the Catholic University of Leuven.

I participated in the design of the "Early Science" observations for the HIFI-Herschel instrument and in the "Early Science" for the study of dust formation around evolved stars for the future Origins Space Telescope mission (NASA) in the far infrared.

Within the Dep. of Molecular Astrophysics I lead the research line on massive evolved stars. This research line has been my main focus since my PhD and I am one of the main researchers in this field, especially in the millimeter domain. I have given invited talks on this topic at the University of Bonn, Chalmers, Torun, or a review talk at the APN VI in Mexico.

My works on this field have focused on the study of the molecular content of the ejecta around massive evolved stars, both its chemistry and its structure (e.g. Quintana-Lacaci et al. 2007, 2013, 2016, 2023). I detected for the first time NO and methanol in evolved stars, confirmed the N enrichment suggested by theory, I suggested the existence of previously unknown objects (C-rich massive evolved stars, Quintana-Lacaci et al. 2019) for which I studied the structure and I am currently studying their chemistry, as well as being the first to observe and suggest that the Red Supergiant stars present two different mass loss processes (Quintana-Lacaci et al. 2023). I am currently working on forthcoming studies to understand the chemistry of these ejecta (AFGL2233, IRC+10401, NML Cyg,...). Also, I am Co-leading a new international group devoted to increasing the number of these massive objects studied to obtain a solid background to build a solid scenario to understand their evolution.

I have been granted observing time in 45 observing proposals as PI, with single-dish telescopes, Interferometers, and Space observatories.

I have also contributed to the study of the emission from metal-rich species in the AGB phase (Quintana-Lacaci et al. 2017, 2016), and have been responsible for the data reduction of the first JWST data obtained toward a PNe (Sahai et al. 2023).

I have been invited to IRAM Grenoble as an expert user and pioneer in the reduction of interferometric data obtained with ALMA with the GILDAS package. I work closely with its developers to solve problems and needs that may arise. I am in charge of reducing most of the data of the Nanocosmos group and I help other groups with this process. I have gained great expertise in the data reduction and preparation of observations of data from different facilities such as ALMA, IRAM 30m, HIFI-Herschel, or more recently JWST among others, thus being an essential member of different working groups at different stages of the research. Also, I have developed software to analyze and visualize ALMA data in 3D (ASTRUCTURES), which has been made available to the community (github).

In terms of management and organization, I have been Bolometer pool Manager at IRAM, managing observation time granted to the bolometer, inviting observers, as well as doing the revisions and maintenance of the bolometer and its control system as well. I participated in the commissioning of the Gismo-II bolometer (NASA) at the IRAM 30m telescope and I was the users' representative for ESA during the Herschel mission, in the spectral mapping observation mode.

I have performed technical tests and written technical papers for the 40m Yebes and IRAM 30m radio telescopes. I have given guided tours to the Real Observatorio Astronómico de Madrid, the IRAM radio telescope, and the ICMM institute and given other informative talks (e.g. 4ESO +empresa program, 2019, 2022, 2023). I have participated in writing press releases about my scientific publications, some published in national newspapers and in the IRAM Newsletter. I

have been interviewed in Cadena SER and science-related podcasts to explain my work at the Molecular Astrophysics Dept. and I have participated in the activities of my institute in the "Semana de la ciencia (2019)".

Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES

C.1. Publicaciones más importantes en libros y revistas con "peer review" y conferencias

AC: Autor de correspondencia; (n° x / n° y): posición firma solicitante / total autores. Si aplica, indique el número de citas

- 1 Artículo científico.** Quintana-Lacaci, G. (AC); Velilla-Prieto, L.; Agúndez, M.; Fonfría, J.P.; Cernicharo, J.; Decin, L.; Castro-Carrizo, A.(1/7). 2023. History of two mass loss processes in VY CMA: Fast outflows carving older ejecta *Astronomy and Astrophysics*. 669.
- 2 Artículo científico.** Sahai, R.; Bujarrabal, V.; Quintana-Lacaci, G.; Reindl, N.; Van de Steene, G.; Contreras, C.S.; Ressler, M.E.(3/7). 2023. The Binary and the Disk: The Beauty is Found within NGC3132 with JWST *Astrophysical Journal*. 943-2.
- 3 Artículo científico.** Quintana-Lacaci, G. (AC); Cernicharo, J.; Agúndez, M.; et al; Alcolea, J.(1/9). 2019. Hints of the existence of C-rich massive evolved stars.*Astrophysical Journal*. IOPScience. 876-2, pp.116.
- 4 Artículo científico.** Quintana-Lacaci, G. (AC); Agúndez, M.; Cernicharo, J.; Bujarrabal, V.; Sánchez Contreras, C.; Castro-Carrizo, A.; Alcolea, J.(1/7). 2016. A ? 3 mm and 1 mm line survey toward the yellow hypergiant IRC +10420: N-rich chemistry and IR flux variations *Astronomy & Astrophysics*. EDP Sciences. 592, pp.A51.
- 5 Artículo científico.** Quintana-Lacaci, G. (AC); Cernicharo, J.; Agúndez, M.; et al; Guélin, M.(1/10). 2016. HINTS of A ROTATING SPIRAL STRUCTURE in the INNERMOST REGIONS AROUND IRC +10216 *Astrophysical Journal*. IOP Publishing Ltd.. 818-2.
- 6 Artículo científico.** Quintana-Lacaci, G. (AC); Agúndez, M.; Cernicharo, J.; Bujarrabal, V.; Sánchez Contreras, C.; Castro-Carrizo, A.; Alcolea, J.(1/7). 2013. Detection of circumstellar nitric oxide. Enhanced nitrogen abundance in IRC +10420 *Astronomy and astrophysics*. EDP Sciences. 560, pp.L2-L6.
- 7 Artículo científico.** Teyssier, D.; Quintana-Lacaci, G.; Marston, A.P.; et al; Waters, L.B.F.M.2012. Herschel/HIFI observations of red supergiants and yellow hypergiants. I. Molecular inventory *Astronomy and Astrophysics*. EDP sciences. 545, pp.A99-A113.
- 8 Artículo científico.** Castro-Carrizo, A.; Quintana-Lacaci, G.; Neri, R.; et al; Grewing, M.(2/11). 2010. Mapping the 12CO J = 1-0 and J = 2-1 emission in AGB and early post-AGB circumstellar envelopes. I. The COSAS program, first sample *Astronomy and Astrophysics*. EDP Sciences. 523, pp.A59-A94.
- 9 Artículo científico.** G. Quintana-Lacaci (AC); V. Bujarrabal; A. Castro-Carrizo; J. Alcolea. (1/4). 2007. The chemical composition of the circumstellar envelopes around yellow hypergiant stars *Astronomy and Astrophysics*. EDP Sciences. 471, pp.551-560.
- 10 Artículo científico.** A. Castro-Carrizo; G. Quintana-Lacaci; V. Bujarrabal; R. Neri; J. Alcolea. (2/5). 2007. Arcsecond-resolution 12CO mapping of the yellow hypergiants IRC +10420 and AFGL 2343 *Astronomy and astrophysics*. EDP Sciences. 465, pp.457-467.

C.3. Proyectos o líneas de investigación

- 1 Proyecto.** MOLECULAR GAS AS PRECURSOR OF DUST GRAINS IN EVOLVED STARS. FROM DYING STARS TO THE INTERSTELLAR. Cernicharo Quintanilla. (INSTITUTO DE FISICA FUNDAMENTAL). 01/06/2020-01/06/2024. 181.500 €.
- 2 Proyecto.** Gas and Dust from the Stars to the Laboratory: Exploring the NanoCosmos, (NANOCOSMOS). European Research Council. Jose Cernicharo Quintanilla. (CSIC, CNRS, Univesidad Valladolid, IGN-OAN, Universidad Castilla La Mancha). 01/08/2014-31/07/2020. 14.983.261 €.

- 3 Proyecto.** FISICO-QUIMICA DEL MEDIO INTERSTELAR Y CIRCUNESTELAR EN LA ERA DE ALMA. Javier Rodríguez Goicoechea. (AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (CSIC)). 01/01/2013-31/12/2015. 369.720 €.
- 4 Proyecto.** Astrofísica Molecular: la Era de Herschel y ALMA. José Cernicharo Quintanilla. (CSIC, OAN, IAC, UVA, UMU, UCM, UCLM, UPO). 12/2009-12/2014. 4.800.000 €.
- 5 Proyecto.** AMIGA al cubo: Naturaleza, Entorno y Herramientas VO. Ministerio de Ciencia e Innovación. Investigación. 1. (Instituto de Astrofísica de Andalucía, Instituto de Radioastronomía Milimétrica). 01/01/2009-31/12/2011. 294.000 €.
- 6 Proyecto.** Spanish participation in the heterodyne instrument HIFI for the Herschel Space Observatory. Ministerio de Ciencia e Innovación. Investigación. (CNIG/OAN). 2004-2007. 1.210.000 €.