



MINISTERIO
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Plan de
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AGENCIA
ESTATAL DE
INVESTIGACIÓN

CURRICULUM VITAE (CVA)

Part A. PERSONAL INFORMATION

CV date

10/10/2023

First name	V́ctor Manuel		
Family name	Rivilla Rodŕguez		
Gender	Male	Birth date	21/09/1985
ID number	70070880T		
e-mail	vrivilla@cab.inta-csic.es	URL:	https://cab.inta-csic.es/astrochem/rivilla.html
ORCID	0000-0002-2887-5859		
Scopus	55579383100		
Google Scholar	https://scholar.google.com/citations?hl=en&authuser=2&user=C7S4kWEAAAAJ		

A.1. Current position

Position	Ramon y Cajal Researcher		
Initial date	01/05/2022		
Institution	Spanish Research Council (CSIC)		
Department/Center	Astrophysics / Centro de Astrobiología (CAB), CSIC-INTA		
Country	Spain	Teleph. number	617888155
Key words	Astronomy & Astrophysics, Astrochemistry, Prebiotic Chemistry, Molecules, Star formation, Interstellar Medium, Origin of Life		

A.2. Previous positions

Period	Position/Institution/Country/Interruption cause
2020-2022	Atracción de Talento CAM Senior Fellowship / CAB (CSIC-INTA) / Spain
2017-2020	Marie Skłodowska-Curie ASTROFIT2-COFUND Fellowship / INAF-Osservatorio Astrofisico di Arcetri / Italy
2015-2017	Postdoc / INAF-Osservatorio Astrofisico di Arcetri / Italy
2014	Postdoc / CAB (CSIC-INTA) / Spain

A.3. Education

PhD in Astrophysics	Univ. Autónoma de Madrid / Spain	2014
Master in Astrophysics	Univ. Autónoma de Madrid & Univ. Complutense de Madrid / Spain	2010
Physics Degree	Universidad Autónoma de Madrid / Spain	2008

Part B. CV SUMMARY (max. 5000 characters, including spaces)

My scientific research aims at elucidating up to what extent the chemistry that takes place in the molecular clouds of the interstellar medium is able to synthesize molecules that are important for driving the prebiotic chemistry that allowed the emergence of life on Earth. To achieve this goal, I have adopted a multidisciplinary approach that combines: **i)** the discovery and characterization of astronomical sources with astrobiological potential; **ii)** ultra-high sensitivity radio astronomical observations to search for new prebiotic species; **iii)** the development of new chemical models and data analysis tools; and **iv)** a strong involvement in pushing spectroscopic characterization of key prebiotic molecules in the laboratory. My research has reported the first detections in the interstellar medium and in comets of several key prebiotic species relevant for supporting the RNA world hypothesis for the origin of life, such as ethanalamine (precursor of phospholipids), hydroxylamine or 1,2-ethenediol (precursors of RNA nucleotides), cyanomethanimine (precursor of adenine), glycolamide (isomer of glycine), or phosphorus oxide. The combination of my observations with chemical models have shed important clues about the formation of these molecules in the interstellar medium. I have also proposed to different spectroscopic laboratories to produce and characterize a number of key molecules in the context of the RNA world to be searched in space.

I am author of **105 peer-reviewed scientific articles (20 as first author, see [this link](#))**, including an article as first author in *Proceedings of the National Academy of Sciences of the United States of America* (2022-2023 IF 12.78). My publications have received so far more than **2532 citations** and my current **h-index is 29** (source: Google Scholar).

I have been invited to give more than **31 invited talks and seminars** at international conferences and research centres, and I have presented my work in **31 contributed talks** at international conferences. My scientific projects have received two Seal of Excellence (quality label awarded by the European Commission), my PhD thesis Finalist of the “Best Spanish doctoral thesis in Astrophysics Prize”, awarded by the Spanish Astronomical Society; and I have won two Best Poster awards in scientific conferences.

I have obtained **more than 1.2 M€ from highly-competitive grants**, which have fully funded my research and also of **my own research group at CAB**. I have supervised **2 postdocs, 2 PhD students, 8 graduate/Master students, and 4 undergraduate students**.

I am the **principal investigator of 39 observational projects** that have been accepted after highly-competitive proposals calls in the most important world-wide astronomical facilities: the Atacama Large Millimeter Array (more than 120 hours of total observing time), Very Large Array (VLA), IRAM NOEMA interferometer, Sub-millimeter Array (SMA), IRAM 30m telescope, APEX telescope, Yebes telescope, Green Bank telescope (GBT), Effelsberg telescope, and Nobeyama radio telescope.

I have chaired or co-chaired three Scientific Organising Committees (SOC) of international conferences, being part of other three as SOC member, and another two as Local Organising Committee (LOC).

I was member of the NRAO Science Review Panel (VLA and GBT telescopes) for the period 2021-2022, and I am a reviewer for several funding agencies such as the National Research, Development and Innovation Office, NRD (Hungary), and the “Agencia Nacional de Investigación y Desarrollo” of Chile. I regularly serve as reviewer on a regular basis for several journal in astrophysics, chemistry and astrobiology: *Astronomy & Astrophysics*, *The Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*, *ACS Earth and Space Chemistry*, or *Astrobiology*.

I am member of the “Cradle of Life” working groups of the future interferometers Square Kilometer Array (SKA) and the Next Generation Very Large Array (ngVLA), and of the European Astrobiology Institute (EAI) “The pathway to complexity: From simple molecules to first life” working group. I am part of the scientific team of two ALMA Large Programs (ALCHEMI and ACES).

My research has been selected for more than **26 press releases** of many word-leading research institutions and scientific journals. I have been interviewed by several Spanish TV (Telediario de TVE), radios (RNE, Onda Cero) and newspapers (El País, La Vanguardia, La Voz de Galicia).

I have been also very active in dissemination and outreach activities, giving public talks, Youtube talks/discussions and publishing outreach articles in scientific magazines, such as [Investigación y Ciencia](#) (Spanish version of *Scientific American*), the [Boletín of the Spanish Astronomical Society](#), or the [Colle di Galileo](#) journal, and several [chapter books](#) and [scientific blogs for a general audience](#). I have also delivered several talks about astronomy and space exploration for kids in schools and high-schools.

Part C. RELEVANT MERITS

C.1. Publications (10 most relevant publications as first author in the last 5 years):

1. Rivilla, V. M.; Sanz-Novo, M.; Jiménez-Serra, I.; Martín-Pintado, J; Colzi, L.; Zeng, S.; Megías, A.; López-Gallifa, Á.; Martínez-Henares, A.; Massalkhi, S.; Tercero, B.; de Vicente, P.; Martín, S.; San Andrés, D.; Requena-Torres, M. Á.; Alonso, J.L; 2023, *First Glycine Isomer Detected in the Interstellar Medium: Glycolamide (NH₂C(O)CH₂OH)*, *The Astrophysical Journal Letters*, 953, L20

2. Rivilla, V. M.; García de la Concepción, J.; Jiménez-Serra, I.; Martín-Pintado, J.; Colzi, L.; Tercero, B.; Megías, A.; López-Gallifa, A.; Martínez-Henares, A.; Massalkhi, S.; Martín, S.; Zeng, S.; de Vicente, P.; Rico-Villas, F.; Requena-Torres, M. A.; Cosentino, G., 2022, *Ionize Hard: Interstellar PO⁺ detection*, *Frontiers in Astronomy and Space Science, Sec. Astrochemistry*, Volume 9, id.829288, 16 pp.

- 3. Rivilla, V. M.;** Jiménez-Serra, I.; Martín-Pintado, J.; Colzi, L.; Tercero, B.; de Vicente, P.; Zeng, S.; Martín, S.; García de la Concepción, J.; Bizzocchi, L.; Melosso, M.; Rico-Villas, F.; Requena-Torres, M. A., 2022, *Molecular Precursors of the RNA-World in Space: New Nitriles in the G+0.693–0.027 Molecular Cloud*, *Frontiers in Astronomy and Space Science, Sec. Astrochemistry*, Volume 9, id.876870, 18 pp.
- 4. Rivilla, V. M.;** Colzi, L.; Jiménez-Serra, I.; Martín-Pintado, J.; Megías, A.; Melosso, M.; Bizzocchi, L.; López-Gallifa, A.; Martínez-Henares, A.; Massalkhi, S.; Tercero, B.; de Vicente, P.; Guillemin, J. C.; García de la Concepción, J.; Rico-Villas, F.; Zeng, S.; Martín, S.; Requena-Torres, M. A.; Tonolo, F.; Alessandrini, S.; Dore, L.; Barone, V.; Puzzarini, C., 2022, *Precursors of the RNA World in Space: Detection of (Z)-1,2-ethenediol in the Interstellar Medium, a Key Intermediate in Sugar Formation*, *The Astrophysical Journal Letters*, Volume 929, id.L11, 9 pp.
- 5. Rivilla, V. M.;** Jiménez-Serra, I.; García de la Concepción, J.; Martín-Pintado, J.; Colzi, L.; Rodríguez-Almeida, L. F.; Tercero, B.; Rico-Villas, F.; Zeng, S.; Martín, S.; Requena-Torres, M. A.; de Vicente, P., 2021, *Detection of the cyanomethyl radical (HNCN): a new interstellar species with the NCN backbone*, *Monthly Notices of the Royal Astronomical Society*, Volume 506, Issue 1, pp.L79-L84.
- 6. Rivilla, V. M.;** Jiménez-Serra, I.; Martín-Pintado, J.; Briones, C.; Rodríguez-Almeida, L. F.; Rico-Villas, F.; Tercero, B.; Zeng, S.; Colzi, L.; de Vicente, P.; Martín, S.; Requena-Torres, M. A., 2021, *Discovery in space of ethanamine, the simplest phospholipid head group*, *Proceedings of the National Academy of Science*, Volume 118, id.e2101314118, 8 pp.
- 7. Rivilla, V. M.;** Martín-Pintado, J.; Jiménez-Serra, I.; Martín, S.; Rodríguez-Almeida, L. F.; Requena-Torres, M. A.; Rico-Villas, F.; Zeng, S.; Briones, C., 2020, *Prebiotic Precursors of the Primordial RNA World in Space: Detection of NH₂OH*, *The Astrophysical Journal Letters*, Volume 899, Issue 2, id.L28.
- 8. Rivilla, V. M.;** Drozdovskaya, M. N.; Altwegg, K.; Caselli, P.; Beltrán, M. T.; Fontani, F.; van der Tak, F. F. S.; Cesaroni, R.; Vasyunin, A.; Rubin, M.; Lique, F.; Marinakis, S.; Testi, L., the ROSINA team, 2020, *ALMA and ROSINA detections of phosphorus-bearing molecules: the interstellar thread between star-forming regions and comets*, *Monthly Notices of the Royal Astronomical Society*, Volume 492, Issue 1, p.1180-1198.
- 9. Rivilla, V. M.;** Martín-Pintado, J.; Jiménez-Serra, I.; Zeng, S.; Martín, S.; Armijos-Abendaño, J.; Requena-Torres, M. A.; Aladro, R.; Riquelme, D., 2019, *Abundant Z-cyanomethanimine in the interstellar medium: paving the way to the synthesis of adenine*, *Monthly Notices of the Royal Astronomical Society: Letters*, Volume 483, Issue 1, p.L114-L119.
- 10. Rivilla, V. M.;** Jiménez-Serra, I.; Zeng, S.; Martín, S.; Martín-Pintado, J.; Armijos-Abendaño, J.; Viti, S.; Aladro, R.; Riquelme, D.; Requena-Torres, M. A.; Quénard, D.; Fontani, F.; Beltrán, M. T., 2018, *Phosphorus-bearing molecules in the Galactic Center*, *Monthly Notices of the Royal Astronomical Society: Letters*, Volume 475, Issue 1, p.L30-L34.

C.2. Invited seminars and conferences talks

I have been invited to give more than **31 invited talks and seminars** at international conferences and research centres. I list here 10 examples in the last 4 years:

- 1. New molecular precursors of the RNA-world in the interstellar medium: the G+0.693 astrochemical mine**, American Chemical Society (ACS) Fall meeting, August 13 – 17, San Francisco (USA) and Hybrid
- 2. New molecular precursors of the RNA-world in the interstellar medium: the G+0.693 astrochemical mine**, Conference PCPAI Physical and Chemical Processes of Astrophysical Interest – Towards the detection of new species, 12-15 June 2022, Saint Florent, Corsica, France
- 3. Molecular precursors of the RNA-world in the interstellar medium: the astrochemical mine found towards the G+0.693-0.027 molecular cloud**, Dust Ice and Gas (DIG) online conference, 17th-18th November 2022.
- 4. Molecular precursors of the RNA-world in the interstellar medium**, seminar at University of Cologne, October 17th 2022.
- 5. Molecular precursors of the RNA-world in the interstellar medium**, July 17 2022, COSPAR 2022 44th Scientific Assembly, Athens, Greece.
- 6. Phosphorus-bearing molecules in space**, July 21 2022, COSPAR 2022 44th Scientific Assembly, Athens, Greece.

7. The Pathway to Prebiotic Chemistry: molecular precursors from space, European Astrobiology Academy 2021-2022, January 26 2022, online seminar.

8. Precursores moleculares de la vida en el medio interestelar, II Congreso Nacional de Estudiantes de Biociencias, October 15 2021, Cáceres, Universidad de Extremadura, Spain.

9. Molecular precursors of the RNA-world in the interstellar medium, October 5 2021, seminar at Osservatorio Astrofisico di Arcetri, Florence, Italy.

10. The interstellar journey of phosphorus, February 24 2021, Astrochemical Discussions online seminars.

C.3. Research projects

I include below the funded scientific projects in which I have been the **Principal Investigator**:

1. Title: ECCOSS - Emergence and Evolution of Chemical COmplexity in Space (ECCOS); Type: Proyectos de Generación de Conocimiento 2022; Project ID: PID2022-136814NB-I00; Funding agency: Agencia Estatal de Investigación (AEI); Dates: 01/09/2023 - 31/08/2026; PI: Izaskun Jiménez-Serra and Víctor M. Rivilla, Number of participants: 4; Funds awarded: 377.500,00 €.

2. Title: COOL - Cosmic Origins Of Life; Type: Proyectos intramurales especiales del CSIC; Project ID: 20225AT015; Funding agency: CSIC y Centro de Astrobiología (CSIC-INTA); Dates: 01/01/2023 - 31/12/2025; PI: Víctor M. Rivilla, Number of participants: 3; Funds awarded: 150.000,00 €.

3. Title: COOL - Cosmic Origins Of Life; Type: Ayudas Ramón y Cajal 2020; Project ID: RYC2020-029387-I; Funding agency: Agencia Estatal de Investigación (AEI); Dates: 01/05/2022 - 30/04/2027; PI: Víctor M. Rivilla; Number of participants: 2; Funds awarded: 296.368,0 €

4. Title: COOL - Cosmic Origins Of Life, Type: Atracción de Talento Modalidad 1 (Doctores con experiencia), 2019; Project ID: 2019-T1/TIC-15379; Funding agency: Comunidad de Madrid; Dates: 01/08/2020 - 31/07/2024 (declined 31/04/2022); PI: Víctor M. Rivilla; Number of participants: 4; Funds awarded: 301.000,00 €

5. Title: BIOSFERA (Birth Of Stars and liFE: Edge Research at INAF); Type: Marie Skłodowska Curie; Project ID: grant agreement No. 664931; Funding agency: European Commission (Horizonte 2020 programme); Dates: 01/08/2017 - 31/07/2020; PI: Víctor M. Rivilla; Number of participants: 1; Funds awarded: 150.000,00 €

I have been also involved as member of the scientific team in the following projects (last 10 yr):

6. Title: CAB Contribution to SPICA, development of cryogenic instrumentation and multiwavelength scientific exploitation; Type: Convocatoria Plan Estatal; Project ID: PID2019-105552RB-C41; Funding agency: Agencia Estatal de Investigación (AEI); PI: Francisco Najarro e Izaskun Jiménez-Serra; Dates: 01/06/2020 - 31/05/2023; Funds awarded: 1.108.965,00 €

7. Title: Spanish contribution A to the cryogenic missions SPICA and ATHENA, HERSCHEL post-operational tasks and scientific multiwavelength exploitation; Type: Convocatoria Plan Estatal; Project ID: ESP2017-86582-C4-1-R; Funding agency: MINECO; Dates: 2018-2019; PI: Francisco Najarro y Giovanni Miniutti; Number of participants: 11; Funds awarded: 735.680,00 €

8. Title: Spanish contribution to the cryogeny of space mission: development for SPICA and ATHENA, post-operational scientific multiwavelength exploitation; Type: Convocatoria Plan Estatal; Project ID: ESP2015-65597-C4-1-R; Funding agency: MINECO; Dates: 2016-2017; PI: Francisco Najarro y Jesús Martín-Pintado; Number of participants: 11; Funds awarded: 460.000,00 €

9. Title: Contribución Española a misiones espaciales en el infrarrojo medio y lejano: participación en SPICA, post-operaciones de Herschel y explotación científica multifrecuencia; Type: Convocatoria Plan Estatal; Project ID: ESP2013-47809-C3-1-R; Funding agency: MINECO; Dates: 2014-2015; PI: Francisco Najarro y Jesus Martín-Pintado; Number of participants: 10; Funds awarded: 80.000,00 €

10. Title: Spanish contribution to SAFARI/SPICA (Phase B) and HERSCHEL (Phase D). Scientific exploitation of observations in the mid- and far-IR with satellites; Type: Convocatoria Plan Estatal; Project ID: AYA2010-21697-C05-01; Funding agency: MICINN; Dates: 2011-2013; PI: Jesús Martín-Pintado; Number of participants: 7; Funds awarded: 1.663.750,00 €