

María Teresa Valdivia Mena

Curriculum Vitae

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Education

- September 2020 - **PhD (Dr. rer. nat) in Astrophysics**, *Max Planck Institut für Extraterrestrische Physik - Ludwig Maximilians Universität*, Garching Germany, **Currently enrolled through the International Max Planck Research School.**
- March 2018 - **Master of Science in Astronomy**, *Universidad de Chile*, Santiago, Chile, **Thesis Title:** Molecular Clouds in Extreme Environments of the Low-Metallicity Magellanic System.
- August 2020
- March 2014 - **Bachelor of Science in Astronomy**, *Universidad de Chile*, Santiago, Chile, Graduated with Highest Distinction.
- December 2017
- March 2016 - **Minor in Scientific Computing**, *Universidad de Chile*, Santiago, Chile.
- December 2017
- March 2012 - **International Baccalaureate (IB) Diploma**, *Santiago College School*, Santiago, Chile.
- December 2013 High Level: Physics, Mathematics and English (Literature).

Research Experience

I currently work at the Center for Astrochemical Studies in the Max Planck Institut für Extraterrestrische Physik under the supervision of Dr. Paola Caselli and Dr. Jaime Pineda. My research focuses on the physical and chemical properties of the envelopes around Class 0/I young stellar objects. I investigate recently discovered asymmetrical gas inflows and how they affect the mass accretion process of embedded protostars. For this purpose, I use several molecular line observations coming from single-dish telescopes (like the IRAM 30m telescope) and interferometric arrays (for example, ALMA and NOEMA).

Until August 2020, I did my Masters at the Department of Astronomy in Universidad de Chile, supervised by Dr. Mónica Rubio. I analysed the physical properties of molecular clouds in low-metallicity environments, such as the Magellanic Clouds, mostly using carbon monoxide isotopologues emission and dust continuum emission in the far-infrared and submillimeter regime. I used recent observations from the Atacama Large Millimeter/Submillimeter Array (ALMA) and Atacama Pathfinder Explorer (APEX) telescopes, together with archival far-infrared data from the Herschel and Spitzer telescopes.

Publications and Proceedings

PRODIGE - Envelope to disk with NOEMA I. The first streamer feeding a Class I protostar, Valdivia-Mena, M. T. , Pineda, J. E., Segura-Cox, D. M., Caselli, P. et. al., Submitted to A&A in February, 2022.

September 2020 **ALMA resolves molecular clouds in metal-poor Magellanic Bridge A**, Valdivia-Mena, M. T., Rubio, M., Bolatto, A. D., Saldaño, H. P. and Verdugo, C., *Astronomy & Astrophysics*, 641, A97.

August 2019 **Molecular Clouds resolved with ALMA ^{12}CO J=1-0 and J=2-1 observations towards the Magellanic Bridge**, Valdivia, M. T., Muñoz, M., Rubio, M. and Saldaño, H., *Boletín de la Asociación Argentina de Astronomía*, 61, 134-136.

Participation in Conferences and Meetings

March 2nd - 4th, 2022 **Meeting of ALMA Young Astronomers**, Virtual, European ALMA Regional Centre Network, **Talk:** *Rivers in the sky: streamers discovered towards two Class I sources in Perseus*.

November 4th - 5th, 2021 **12th IMPRS Students Symposium**, Max Planck Institute for Astrophysics, Garching, Germany, **LOC member and Talk:** *River in the sky: A streamer feeding a Class I protostar*.

October 4th - 29th, 2021 **Gaps, Rings, Spirals, and Vortices: Structure Formation in Planet-Forming Disks**, Munich Institute for Astro- and Particle Physics, Garching, Germany, **Talk:** *A Class I protostar with a high streamer mass infall rate*.

June 28th - July 2nd, 2021 **European Astronomical Society Annual Meeting 2021**, Virtual, Leiden, Netherlands, **Talk:** *River in the sky: A streamer feeding a Class I protostar*.

November 3th - 9th, 2019 **Latin American Regional IAU Meeting 2019**, Hotel Antofagasta, Antofagasta, Chile, **Talk:** *ALMA observations of molecular tracers in R136 in 30Dor: How does cold gas survive?*.

October 14th - 18th, 2019 **ALMA2019: Science Results and Cross-Facility Synergies**, T-Hotel Cagliari, Cagliari, Italy, **Poster (Co-Authored with M. Rubio):** *Cold Gas Survives near R136 in 30 Doradus*.

October 7th - 12th, 2018 **Second Binational AAA-SOCHIAS Meeting**, Hotel Club La Serena, La Serena, Chile, **Poster:** *Molecular Clouds Resolved in $^{12}\text{CO}(1-0)$ and $^{12}\text{CO}(2-1)$ in the Magellanic Bridge*.

Observing Experience

IRAM 30m: I have observed remotely in two occasions: for project 124-21 (2022A), which I am the PI, and also assisted in observations for project 090-21 (2021B) (PI: Jaime Pineda).

APEX: I have been a Chilean time observer at the Atacama Pathfinder Experiment (APEX) telescope in three occasions: June 2017 (2017A), April 2018 (2018A) and May 2019 (2019A). I was granted observing time at APEX under project C104-9709 (2019B).

Workshops

November 15th - 23rd, 2021 **10th IRAM 30-meter School on Millimeter Astronomy**, Virtual Workshop, Institut de Radioastronomie Millimétrique.

March 14th - 19th, 2021 **2021 Submillimeter Array Interferometry School**, Virtual Workshop, Harvard & Smithsonian Center for Astrophysics, in conjunction with the ASIAA and the University of Hawaii.

October 7th - 11th, 2019 **European Radio Interferometry School 2019**, Quality Hotel Panorama, Onsala Space Observatory, Gothenburg, Sweden.

- October 1st - 5th, 2018 **II International Astrochemistry School**, *Universidad Autónoma de Chile*, Santiago, Chile.
- August 20-29th, 2018 **La Serena School for Data Science: Applied Tools for Data Driven Sciences**, *Association of Universities for Research in Astronomy (AURA) Campus*, La Serena, Chile, **Project:** *Global Obesity Prevalence: Important Factors and Characteristics*.
- March 6-7th, 2017 **Workshop de Estudiantes de Astronomía**, *Observatorio Astronómico Nacional*, Santiago, Chile, **Talk:** *Characterizations of CO Emissions in MagBridgeC*.

Teaching Experience

- September 2018 - July 2019 **Teaching Assistant for the course "Experimental Astronomy"**, *Universidad de Chile*, Includes giving classes, marking and supervising activities, Undergraduate course.
- March 2019 - July 2019 **Teaching Assistant for the course "Introduction to Cosmology"**, *Universidad de Chile*, Includes giving classes and marking, Undergraduate course.
- January 2019 **Teaching Assistant for Universidad de Chile's Summer School**, *Escuela de Verano, Universidad de Chile*, Course: Planetary Sciences, High School level.
- September 2017 - October 2017 **Teaching Assistant for the Data Visualization Diploma**, *Pontificia Universidad Católica de Chile*, Diploma Course.
- March 2017 - July 2017 **Teaching Assistance for the course "Mechanics"**, *Universidad de Chile*, Includes giving classes and marking, Undergraduate Course.

Outreach Experience

- July 2018 - Present **Member of "Cazadoras de Estrellas" Project**, *DIRVEX, Universidad de Chile*, This outreach project is lead by a group of female graduate students and alumni from the Astronomy Department in Universidad de Chile. The goal is to give high school girls a hands-on experience with astronomical data and meet female astronomers so that they can solve any vocational doubts about this career.
- June 27th 2019 **"Eclipses: Luces y Sombras en el Universo"**, *Public talk, Middle School level*, *Municipalidad de El Bosque*, Santiago, Chile.
- April 9th, 2019 **"Astroinformática para principiantes"**, *Public talk, High School level*, *DUOC UC Puente Alto*, Santiago, Chile.
- March 21st, 2019 **"Astroinformática para principiantes"**, *Public talk, General Audience level*, *Centro de Extensión de la Universidad de Talca*, Talca, Chile.
- June 2018 - November 2018 **Scientific Counselor**, *Liceo Polivalente San José de Maipo*, Festival de Teatro y Ciencias (FETYC), Par Explora Sur Oriente, CONICYT.
The FETYC is a theatre competition organized by the National Commission of Scientific and Technologic Investigation (CONICYT) where several schools prepare a play around a scientific inquiry. The Scientific Counselor guides the scientific content of the plays.
- March 2018 - August 2018 **Tourist Guide**, *National Astronomical Observatory, Departamento de Astronomía, Universidad de Chile*.

Skills and Qualifications

- Languages** English (TOEFL iBT: 113/120), Spanish (Native)
- Programming** Python, Java, C, Matlab/Octave, R, HTML

Astronomy CASA (Common Astronomy Software Applications), GILDAS, SAOImage DS9
Version GitHub, Google Drive
Controlling Tools

Funding and Awards

- July 2018 **Adelina Gutierrez Grant**, *Sociedad Chilena de Astronomía*, The grant funded the assistance to the Second Binational AAA-SOCHIAS Meeting.
- March 2018 **Scholarship for National Master Studies**, *Comisión Nacional de Investigación en Ciencia y Tecnología (CONICYT)*, Chile, The scholarship funds master studies done in chilean universities.
- 2016-2017 **Outstanding Student in the Bachelor of Science in Astronomy**, *Universidad de Chile*.

Service and Leadership

- April 2019 - **Graduate Student Representative**, *Departamento de Astronomía*, Universidad de Chile, Santiago, Chile.
- April 2020
- March 2012 - **Social Service Comission Director**, *Student Council*, Santiago College, Santiago, Chile.
- March 2013
- 2005-2012 **Scout Member**, *Miembro del Grupo de Guías y Scouts del Santiago College*, Distrito Los Leones, Santiago, Chile.

References

Prof. Mónica Rubio, *Ph.D in Astrophysics*, Full Professor, Departamento de Astronomía, Universidad de Chile.
mrubio@das.uchile.cl

Mauricio Vargas, *Data Analyst*, Datawheel LLC, Cambridge, USA.
mvargas@dcc.uchile.cl