

# Dr. Carolina Agurto Gangas

🌐 cagurto.github.io

carolina.agurto@usm.cl

📧 cagurto

📞 +56 988044668

## About me

I am a Doctor in Astronomy from the University of Munich (LMU). My main research interests focus on the early stages of protoplanetary disks, investigating both the characterization of the dusty envelope and the processes of dust growth within the disk by using sub-mm and mm wavelengths. Currently, I'm working in the gas and dust characterization of the ALMA Large Program AGE-PRO (the ALMA survey of Gas Evolution in PROtoplanetary disks). Since June 2025 I am **Assistant Professor at the Physics Department of the Universidad Técnica Federico Santa María**. During the past 10 years I've been involved in the dissemination of astronomy in Chile and during 2023-2024 I was 1st Vice President of the Chilean Astronomical Society (SOCHIAS).

## Education

**Ludwig-Maximilians-Universität München**

*Dr. rer. nat. in Astronomy*

**Munich, DE**

*Graduation: September 22nd, 2020*

**Universidad de Valparaíso**

*MSc. in Astrophysics*

**Valparaíso, CL**

*Graduation: May 2015*

**Universidad de Valparaíso**

*Licentiate in Physics with specialization in Astronomy, BSc degree*

**Valparaíso, CL**

*Graduation: December 2012*

## Awards and Grants

**Comité Mixto ESO-Gobierno de Chile (58K USD)**

**April 2024-2026**

*Postdoctoral Position, PI: L. Pérez & C. Agurto-Gangas, Project: The Role of Gas and Solids in Young and Old Protoplanetary Disks: Insights from ALMA*

**For Women in Science (FWIS) Award**

**Oct 2024**

*Selected as one of the 3 finalists of For Women in Science Award 2024: Postdoctoral category L'Oreal Chile, Unesco and ANID*

**FONDECYT Postdoctoral fellowship 2021 ANID (95K USD)**

**2021-2024**

*Understanding the dust properties and chemical diversity in Class I protostars. Nr 3210520  
Top one project among 41 astronomy, cosmology and particles physics applicants*

**Award 100 Mujeres Líderes 2021**

**Dec 2021**

*Selected as one of the 100 Women Leaders by Fundación Mujeres empresarias, El Mercurio & Universidad Adolfo Ibáñez*

**IAU's Office of Astronomy for Development Grant (5K USD)**

**2021**

*Asteroids workshop AVERO: A rocky adventure. PI: C. Agurto-Gangas, CoPIs: K. Rojas, J. Rey*

**Award 100 Young Chilean Leaders**

**Dec 2018**

*Selected as one of the 100 leaders under 35 by El Mercurio newspaper and Universidad Adolfo Ibáñez*

**Scholarship for Doctorate programs abroad (81K USD)**

**2015-2019**

*Becas Chile, CONICYT Nr. 5594/2015*

**Grants for the Astronomy Graduate Program of the Universidad de Valparaíso**

**2014**

*Gemini-CONICYT Project Nr. 32110004*

**Grants for the Master Astronomy Program at Universidad de Valparaíso**

**2013**

*ALMA-CONICYT Project Nr. 31120015*

## Observational experience

**APEX 2025A accepted proposal:**

○ C-0115.F-970017 C. 6.4 hours Unveiling the Dynamic Large-Scale Structure of Elias 2-24. **PI: C. Agurto-Gangas**

**JWST Cycle 4 accepted proposal:**

○ ID: 8328. 6.2 Primary Spacecraft Hours. Direct detection of a multi-planet system caught in formation. **PI: C. Ginski.**  
**Co-I: C. Agurto-Gangas**

**ALMA Cycle 10 and 9: accepted and observed proposals**

○ 2024.1.01402.S **PI: N. Kurtovic.** **Co-I: C. Agurto-Gangas.** Total time: 36.5h. Characterizing Substructures in Disks Across All Relevant Evolutionary Stages for Planet Formation

○ 2023.1.01106.S **PI: Laura Perez.** **Co-I: C. Agurto-Gangas.** Total time: 28.6h. An ALMA Band 1 and VLA survey to

- probe the solid reservoir of Lupus disks
- 2023.1.01100.S PI: Anibal Sierra. **Co-I: C. Agurto-Gangas**. Total time: 10.2h. Hunting two planet candidates from gas and dust signatures
  - 2022.1.01743.S. **PI: C. Agurto-Gangas**. Total time: 10.8h. Searching for substructures in young protoplanetary disks.
  - 2022.1.01221.S. PI: Laura Perez. **CO-I: C. Agurto-Gangas**. Total time: 12.7h. Investigating the wide variety of planet formation signatures in the HD 143006 system
  - 2022.1.01216.S. PI: Anibal Sierra. **CO-I: C. Agurto-Gangas**. Total time: 11.5h. Dust traps in LkCa 15?
- Atacama Large Millimeter/submillimeter Array** **ALMA, Antofagasta, CL**  
*ALMA Large Program 2021.1.00128.L AGE-PRO: the ALMA survey of*  
 Gas Evolution in PROtoplanetary disks. 2021-2023  
**Col & Data delegate: C. Agurto-Gangas**. Total time: 103.4 h
- NORthern Extended Millimeter Array (NOEMA)** **IRAM, Grenoble, FR**  
*Project S16AT Grain growth in a Class I protoplanetary disk.*  
**PI: C. Agurto-Gangas**. Total time: 7.9h 29-01 Jun/Feb 2017
- Submillimeter Array (SMA)** **Mauna Kea, HI**  
*Support astronomer on MASSES observing program 2014A-S093* 2-6 Jun 2016
- Paranal Observatory** **Antofagasta, CL**  
*Observing program on FORS* 2-4 Jun 2015
- Period measurements of WDMS binaries on CVs period gap
- La Silla Observatory** **La Serena, CL**  
*Observing program on NTT-EFOSC2* 23-30 Nov 2012
- Spectral study of binary systems (K-F-G dwarf) plus white dwarf star, radial velocity and period calculation.

## Teaching & Supervising experience

### Universidad de Chile, Astronomy Department

- 2025 Research Tutor: Basic Tutorial Work (Student: Karolanne Garcia).
- 2024 Mentor & Evaluator: Innovation Project in Engineering and Science course.
- 2024 [ongoing] Co-supervisor: Master students Camila Pulgares and Benjamín Carrera.
- 2023 Public Lecture: Astronomy and Christmas (3 hours).
- 2023 [ongoing] Research Tutor: Basic Tutorial Work & Astronomical Project course (Student: José Mondaca).
- 2022 Public Lecture Series: Look Up: Comets, Asteroids, and Meteorites (8 hours).
- 2022 Research Tutor: Basic Tutorial Work (Students: Camila Pulgares, Carolina Nuñez).
- 2021 Public Lecture Series: Life Search in the Solar System: The Odyssey of Astronomy (8 hours).

### Universidad Santa María, Departamento de Física

- 2022 Invited Speaker: Introduction to Interferometry and CASA Practical Lecture (2 hours).

### Universidad de Valparaíso

- 2012 Assistant Professor: Physics I (B.S. in Mathematics); Lab: Electromagnetism, Waves and Optics (B.S. in Astrophysics).
- 2011 Assistant Professor: Physics I & II (B.S. in Astrophysics).

## Teaching specialization courses

- 2021-2022 **Dirección de Igualdad de Género: DIGEN-GA**, Diploma Course (**Diplomado**): *Gender in Academia: Challenges for the University of Chile's Academic Body*
- April 2022 **Ministerio de desarrollo social y subsecretaria de la niñez**, Curso: *Diversidad e identidad de género Ley 21.210 (Gender Diversity and Identity: Law 21.210)*

## Publications and Proceedings

- Hints of Disk Substructure in the First Brown Dwarf with a Dynamical Mass Constraint** 2025  
 ApJL, **accepted**, Alejandro Santamaria-Miranda, Pietro Curone, Anibal Sierra, Laura M. Pérez, Alvaro Ribas, **Agurto-Gangas, C.**, et.al.
- High angular resolution evidence of dust traps from deep ALMA Band 3 observations of LkCa15** 2025  
 MNRAS **accepted**, Anibal Sierra, Paola Pinilla, Laura M. Pérez, Myriam Benisty, **Agurto-Gangas, C.**, Carlos Carrasco-González, Pietro Curone, Feng Long
- The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO): II. Gas and Dust in the Ophiuchus Star-forming Region** 2025

ApJ <b>accepted</b> , Ruiz-Rodriguez, Dary A., Gonzalez-Ruivola, C., Cieza, L., Zhang, K., Trapman, L., Pinilla, P., Pascucci, I., Perez, L.M., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>X. Dust substructures, disk geometries, and dust-disk radii</b>	2025
ApJ <b>accepted</b> , Vioque, M., Kurtovic, N., Trapman, L., Sierra, A., Perez, L.M., Zhang, K., Curone, P., Rosotti, G., Carpenter, J., Tabone, B., Pinilla, P., Deng, D., Pascucci, I., Miley, J., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>XI. Beam-corrected gas disk sizes from fitting 12CO moment zero maps</b>	2025
ApJ <b>accepted</b> , Trapman, L., Vioque, M., Kurtovic, N., Zhang, K., Rosotti, G., Pinila, P., Carpenter, J., Cieza, L., Pascucci, I., Anania, R., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>I. Program Overview and First Results</b>	2025
ApJ <b>accepted</b> , Zhang, K., Perez, L.M., Pascucci, I., Pinila, P., Cieza, L., Carpenter, J., Trapman, L., Dingshan, D., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>VII. Testing accretion mechanisms from disk population synthesis</b>	2025
ApJ <b>accepted</b> , Tabone, B., G. P. Rosotti, Trapman, L., Pinila, P., Pascucci, I., Somigliana, A., Alexander, R., Vioque, M., Anania, R., Kuznetsova, A., Zhang, K., Perez, L.M., Cieza, L., Carpenter, J., Dingshan, D., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>IV. Dust and Gas Disk Properties in the Upper Scorpius Star-forming Region</b>	2025
ApJ <b>accepted</b> , <a href="#">Agurto-Gangas, C.</a> , Laura Perez, Anibal Sierra, James Miley, Ke Zhang, et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>VI. Comparison of Dust Evolution Models to AGE-PRO Observations</b>	2025
ApJ <b>accepted</b> , Kurtovic, N., Garate, M., Pinila, P., Ke Zhang, G. P. Rosotti, Anania R., Pascucci, I., Tabone, B., Trapman, L., Carpenter, J., Cieza, L., Deng, D., Perez, L.M., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>III: Dust and Gas Disk Properties in the Lupus Star-forming Region</b>	2025
ApJ <b>accepted</b> , Deng, D., Vioque, M., Pascucci, I., Pérez, L., Zhang, K., Kurtovic, N., Trapman, L., Torres-Villanueva, E., <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>XII: Extreme millimetre variability detected in a Class II disc</b>	2025
ApJ <b>accepted</b> , Miley, J., Pérez, L.M., <a href="#">Agurto-Gangas, C.</a> et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO):</b>	
<b>V. Protoplanetary gas disk masses</b>	2025
ApJ <b>accepted</b> , Trapman, L. Zhang, K. Rosotti, G. Pinilla, P. Tabone, B. Pascucci, I. <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>The ALMA Survey of Gas Evolution of PROtoplanetary Disks (AGE-PRO): VIII.</b>	
<b>The impact of external photoevaporation on disk masses and radii in Upper Sco</b>	2024
ApJ <b>accepted</b> , Anania, R. Rosotti, G. Gárate, M. Pinilla, P. Vioque, M. Trapman, L., Carpenter, J., Zhang, K. Pascucci, I. Cieza, L. Miley, J. Sierra, A. Pérez, L. Tabone, B., Hogerheijde, M. <a href="#">Agurto-Gangas, C.</a> , et. al.	
<b>Hints of planet formation signatures in a large-cavity disk studied in the AGE-PRO ALMA Large Program</b>	2024
ApJ <b>accepted</b> , Sierra, A., Pérez, L.M., <a href="#">Agurto-Gangas, C.</a> et. al.	
<b>The AGE-PRO ALMA Survey: A glimpse into the gas evolution in protoplanetary disk</b>	2023
RevMexAA Conference Series edition submitted	
<a href="#">Agurto-Gangas, C.</a> et. al.	
<b>Simple Disk Envelope (SiDE) fit framework</b>	2020
Available in Zenodo	
<a href="#">Agurto-Gangas, C.</a> and L. Szűcs.	
<b>Revealing the dust grain size in the inner envelope of the Class I protostar Per-emb-50</b>	2019
A&A Volume 623, A147	
<a href="#">Agurto-Gangas, C.</a> ; Pineda, J. E.; Szűcs, L.; Testi, Tazzari, M., Miotello, A.; Caselli, P.; Dunham, M.; Stephens, I. W.; Bourke, T.	
<b>Grain growth in Class I protostar Per-emb-50: a dust continuum analysis ...</b>	2017
Proceeding, Memorie della Societa Astronomica Italiana, v.88, p.761.	
<a href="#">Agurto-Gangas, C.</a> ; Pineda, J. E.; Testi, L.; Caselli, P.; Szucs, L.; Tazzari, M.; Dunham, M.; Stephens, I. W.; Miotello, A.	
<b>Determination of Pulsation Periods and Other Parameters of 2875 Stars ...</b>	2016

ApJ Supplement Series, Volume 227, Issue 1, article id. 6, 13 pp.  
 Vogt, N.; Contreras-Quijada, A.; Fuentes-Morales, I.; Vogt-Geisse, S.; Arcos, C.; Abarca, C.;  
[Agurto-Gangas, C.](#); Caviedes, M.; DaSilva, H.; Flores, J.; Gotta, V.; Peñaloza, F.; Rojas, K.;  
 Villaseñor, J. I.

#### **Young stellar clusters in the VVV Survey containing massive YSOs** 2016

ApJ, Volume 152, Issue 3, article id. 74, 23 pp.  
 Borissova, J.; Ramírez Alegría, S.; Alonso, J.; Lucas, P. W.; Kurtev, R.; Medina, N.; Navarro, C.;  
 Kuhn, M.; Gromadzki, M.; Retamales, G.; Fernandez, M. A.; [Agurto-Gangas, C.](#);  
 Chené, A. N.; Minniti, D.; Contreras Pena, C.; Catelan, M.; Decany, I.; Thompson, M. A.;  
 Morales, E. F. E.; Amigo, P.

#### **Detached cataclysmic variables are crossing the orbital period gap** 2016

MNRAS, Volume 457, Issue 4, p.3867-3877.  
 Zorotovic, M.; Schreiber, M. R.; Parsons, S. G.; Gänsicke, B. T.; Hardy, A.; [Agurto-Gangas, C.](#);  
 Nebot Gómez-Morán, A.; Rebassa-Mansergas, A.; Schwöpe, A. D.

#### **VVV Galactic Star Clusters: VVV CL059** 2015

Proceeding VI Reunión sobre Astronomía Dinámica en Latinoamérica (ADeLA 2014), RevMexAA.  
[Agurto Gangas, C.](#); Borissova, J.; Ramirez Alegria, S.; Kurtev, R.; VVV star cluster Team

#### **Fourteen new eclipsing SDSS white dwarf plus main-sequence binaries ...** 2015

MNRAS, Volume 449, Issue 2, p.2194-2204.  
 Parsons, S. G.; [Agurto-Gangas, C.](#); Gänsicke, B. T.; Rebassa-Mansergas, A.; Schreiber, M. R.;  
 Marsh, T. R.; Dhillon, V. S.; Littlefair, S. P.; Drake, A. J.; Bours, M. C. P.; Breedt, E.;  
 Copperwheat, C. M.; Hardy, L. K.; Buisset, C.; Prasit, P.; Ren, J. J.

#### **White dwarf-main sequence binaries from SDSS DR8: unveiling the cool ...** 2013

MNRAS, Volume 433, Issue 4, p.3398-3410.  
 Rebassa-Mansergas, A.; [Agurto-Gangas, C.](#); Schreiber, M. R.; Gänsicke, B. T.; Koester, D.

## Conferences/Schools/Workshop

### **Summary of Presentations and Contributions (2011-2025)**

o **Total Contributions:** 31 | **Total Talks:** 18 | **Total Posters:** 8 | **Total Workshops/Schools Attended:** 5

#### **Talk: Tracing the Gas Disk Evolution in Upper Scorpius with ALMA's AGE-PRO Survey** 11-15 Nov. 2024

XIX SOCHIAS Annual meeting, Arica, Chile

#### **Talk: ALMA Observations of Upper Scorpius Disks: A glimpse into Gas Disk Evolution with AGE-PRO** 15-19 July 2024

NEW HEIGHTS IN PLANET FORMATION, Garching, Germany

#### **Poster: Is grain growth taking place around the young Cosmic Pretzel?** 4-8 Dec 2023

ALMA at 10 years, Past Present and Future, Puerto Varas, Chile

#### **Poster: THE AGE-PRO ALMA Survey: A glimpse into the gas evolution in protoplanetary disks** 27 Nov - 1 Dec 2023

XVII Latin American Regional IAU Meeting, Montevideo, Uruguay

#### **Talk: The AGE-PRO ALMA Survey: A glimpse into the evolution of gas in protoplanetary disks** 3-4 Oct 2023

Discos de Santiago ESO-ALMA Meeting

#### **Talk: AGE-PRO Overview: ALMA survey of Gas Evolution in PROtoplanetary disks** 1-3 Agosto 2023

2nd CATA Meeting, Santiago

#### **Poster: Is grain growth taking place around the cosmic pretzel?** 10-15 Abril 2023

Protostars and Planets VII, Kyoto, Japan

#### **Poster: Is grain growth taking place around the cosmic pretzel?** 13-16 Marzo 2023

XVIII SOCHIAS Meeting. Universidad de la Frontera, Temuco, Chile

#### **COSPAR CAPACITY BUILDING WORKSHOP** 16-27 Jan 2023

PLANETARY SCIENCES DATA ANALYSIS. Universidad de Antofagasta, CL

#### **Workshop Accretion/Ejection Processes in Star Formation:** Nov 30- Dec 2 2022

In Theory and in Practice

European Southern Observatory, Vitacura, CL

#### **Talk: Núcleo Milenio de formación planetaria Workshop** 25-26 Ago 2021

Universidad de Valparaíso, CL

### 2021 Sagan Exoplanet Summer Virtual Workshop:

Circumstellar Disks and Young Planets

NASA Exoplanet Science Institute, Caltech, PASADENA, CA

19-23 Jul 2021

### Talk: Revealing the dust grain size in the inner envelope of the Class I protostar Per-emb-50

24-28 June 2019

### Poster talk: Dust properties inside and outside the disk of BHB07-11

European Week of Astronomy and Space Science. Lyon, France.

## Programming skills

**Programming languages** More than 8 years of experience using Python and libraries Numpy, Scipy, Matlab and emcee.

**Astronomical software** User of RADMC-3D, CASA, MIRIAD, Gildas, Ds9, Topcat, VOSpec. **Operative Systems** Experience with Mac OSX, Linux and Windows.

**Computer skills** Google user: Docs, Sheets, Forms and Slides. Advanced user of Latex/Overleaf and Keynote.

**Digital design skills** Wordpress, iMovie, DaVinci, GIMP and Canva.

**Languages** Native Spanish. Advanced English. Basic German A2

## Certifications

Check certificates here [www.linkedin.com](http://www.linkedin.com)

- **Escuela Lideres Políticas 2021**. 40h lectures from Servicio Nacional de la mujer y equidad de genero
- **Python for Data Science and AI** IBM lectures 22h January 2021
- **Data Science Methodology** IBM lectures 8h December 2020
- **Tools for Data Science** IBM lectures 20h November 2020
- **Python Programing** Course by Technical University of Munich 15h Marzo 2017
- **Git Programing** Course by Technical University of Munich 3h Marzo 2017

## Outreach activities

- 2013-present **Co-founder and Science Communicator**, *Star Tres Project*. *Astronomy outreach initiative*, [www.startres.net](http://www.startres.net), We have shared more than **100 videos about astronomy** on YouTube and the interest of +36k subscriptions. We published AstroCalendario 2020 with Editorial Usach. During 2021 we were granted by IAU for the outreach project (AVERO: AVENTura ROcosa) that have benefit **more than 2000 students around Chile**. Collaborations with Planetario USACH, Minciencia, CECREA, MAS, NPF, SOCHIAS, ESO, ALMA, Marca Chile, SERNAMEG, SERNATUR, ESO Supernova, NAEC-Chile, Puerto de Ideas, Fundación Mustakis, Google Latinoamerica, centro de comunicaciones Universidad Autonoma de Chile, Universidad de Chile, Universidad de Valencia and multiple astronomy and science outreach initiatives
- 2021-present **DAS & CATA TV interviews & media astronomer**, *Collaborator and outreach activities creator*
- 2013-present **Mentoring. EXPLORA and programa de investigación e innovación escolar IIE**, *National outreach programme and assessment of science and technology*

## Community service

- April 2025-present **Chair of the National organizing committee (NOC) for the IAU Chile 2030**
- Nov. 2023-present **Member of the National organizing committee (NOC) for the IAU Chile 2030**, *I prepared and contributed to the document and presentation for the IAU election board in December 2023, April 2024, and August 2024*
- 2023-2024 **1st Vicepresident Chilean Astronomical Society (SOCHIAS)**, *Current duties: SOCHIAS representation meetings. Organization Regional and National Olympics of astronomy and astronautics 2023 and 2024. Newsletter SOCHIAS editor. Chair of the LOC XIX SOCHIAS Annual Meeting*