

# Dr. Carolina Agurto Gangas

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## About me

I am a Doctor of Astronomy from the University of Munich (LMU). My areas of interest are young protoplanetary disks, dust properties, radiative transfer models, interferometry and astrochemistry. I am currently a postdoctoral researcher at the Department of Astronomy at the University of Chile, funded by Comité Mixto ESO-Gobierno de Chile. During the past 10 years I've been involved in the dissemination of astronomy and I'm the co-founder of the Star Tres initiative. I am also the 1st Vice President (2023-2024) 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*

**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**

**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

**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
- o 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.* 29-01 Jun/Feb 2017  
**PI: C. Agurto-Gangas**. Total time: 7.9h
- 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
- o Period measurements of WDMS binaries on CVs period gap
- Observatorio Santa Martina UC** **Santiago, CL**  
*Be stars spectra campaign* 23-27 Feb 2015
- o Spectra for 40 Be stars using Pucheros, a high resolution Echelle spectrograph (R = 17000) mounted ESO telescope at 50cm.
- La Silla Observatory** **La Serena, CL**  
*Observing program on NTT-EFOSC2* 23-30 Nov 2012
- o Spectral study of binary systems (K-F-G dwarf) plus white dwarf star, radial velocity and period calculation.
- Cruz del Sur Observatory** **Combarbalá, CL**  
*Variable stars observation (CCDOps software)* 25-30 Jan 2011

## Teaching experience

- Universidad de Chile:  
 Jan.- Present **Departamento de Astronomía (DAS). Facultad de Ciencias Físicas y Matemáticas (FCFM),**  
*Research tutor: Trabajo Tutorial Básico and curso de Proyecto Astronómico. Student: José Mondaca.*
- Universidad Santa María:  
 20.07.2022 **Departamento de Física. Docente invitada, Invited speaker in Course: Introduction to Interferometry and CASA Practical lecture.**
- Universidad de Chile:  
 March 2022 **Departamento de Astronomía (DAS). Facultad de Ciencias Físicas y Matemáticas (FCFM),**  
*Astronomy General Course: Mira hacia arriba: Cometas, asteroides y meteoritos... de verdad.*
- Jan. 2022 **Departamento de Astronomía (DAS). Facultad de Ciencias Físicas y Matemáticas (FCFM),**  
*Research tutor: Trabajo Tutorial Básico. Students: Camila Pulgares, Carolina Nuñez..*
- Nov. 2021 **Departamento de Astronomía (DAS). Facultad de Ciencias Físicas y Matemáticas (FCFM),**  
*Astronomy General Course: Se busca vida en el Sistema Solar: La odisea de la astronomía.*
- Universidad de Valparaíso:  
 2012 **First semester, Assistant professor in Physic I, B.S. in Mathematics Course.**
- 2012 **First semester, Assistant professor in Laboratory, Electromagnetism, Waves and Optics, B.S. in Astrophysics Course.**
- 2011 **First semester, Assistant professor in Physic I y Physic II, B.S. in Astrophysics Course.**

## Teaching specialization courses

- 2021-2022 **Dirección de Igualdad de Género: DIGEN-GA, Diplomado Género en la Academia: Desafíos para el cuerpo académico de la Universidad de Chile.**
- April 2022 **Ministerio de desarrollo social y subsecretaria de la niñez , Curso: Diversidad e identidad de género Ley 21.210.**

## Publications and Proceedings

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

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## Conferences/Schools/Workshop

**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:**

19-23 Jul 2021

Circumstellar Disks and Young Planets

NASA Exoplanet Science Institute, Caltech, PASADENA, CA

**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.

**Talk: Radiative transfer modelling of a protostellar disk**

4-5 April 2019

7th International Max-Planck Research School on Astrophysics (IMPRS) Symposium.  
MPE, Garching, Germany

**Talk: Radiative transfer modelling for the Per-emb-50 protostellar disk**

5-7 Dec 2018

Center for Astrochemical studies (CAS) Retreat. Ringberg, Germany

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

7-12 Oct 2018

Second Binational Meeting AAA-SOCHIAS. La Serena, Chile

**II International Astrochemistry School**

1-5 Oct 2018

Universidad Autónoma de Chile. Santiago, Chile

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

12 Sep 2018

MPE Science Day 2018. Garching, Germany

**Poster: Revealing the dust grain sizes in the envelope of Per-emb-50**

11-15 Jun 2018

Cosmic Dust: origin, applications and implications. Copenhagen, Denmark

**Talk: Evidence of grain growth in Class I protostar: Per-emb-50**

28-30 Jun 2017

Center for Astrochemical studies (CAS) Retreat. Ringberg, Germany

**Talk: Grain growth in Class I Protostars**

29 May- 23 Jun 2017

MIAPP PROGRAMME: PROTOPLANETARY DISKS AND PLANET FORMATION  
AND EVOLUTION. Garching, Germany

**Poster: Grain growth in Class I protostar Per-emb-50: A dust continuum analysis with NOEMA & SMA**

5-9 Jun 2017

Francesco's legacy: star formation in space and time. Florence, Italy.

**9th IRAM millimeter interferometry School**

10-14 Oct 2016

Institut de Radioastronomie Millimétrique IRAM, Grenoble, France

**Talk: Grain growth in Class I Protostars**

5-6 Oct 2016

2nd International Max-Planck Research School on Astrophysics (IMPRS) Symposium.  
MPE, Garching, Germany

**Talk: Combining the Catalina light curve catalogue and SDSS to identify new eclipsing PCEBs**

**Poster: Young stellar clusters in the VVV Survey containing massive YSOs**

12-15 Mar 2015

XII annual meeting of the Chilean Astronomical Society (SOCHIAS). Puerto Varas, Chile

**First VLT School in Chile**

3-7 Nov 2014

Universidad de Valparaíso, Chile

**Poster: VVV Galactic Star Clusters: VVV CL059**

Aug 29 - Oct 3 2014

VI Reunión sobre Astronomía Dinámica en Latinoamérica (ADeLA 2014). Santiago, Chile

**Poster: VISTA Variables in The Via Lactea Galactic Star Clusters: VVV CL059**

7-8 Aug 2014

First Workshop of Millenium Institute of Astrophysics. Los Andes, Chile

**MAD Planet Formation Summer School**

20-22 Mar 2013

Cerro Calán, Santiago, Chile

**Talk: White dwarf-M dwarf binaries from Sloan Digital Sky Survey**

22-26 Oct 2012

First National Meeting of Physics and Astronomy Students. Valparaíso, Chile

**Talk: White dwarf-M dwarf binaries from Sloan Digital Sky Survey**

10-12 Oct 2012

IX annual meeting of the Chilean Astronomical Society (SOCHIAS). Viña del Mar, Chile

**Poster: White dwarf-M dwarf binaries from Sloan Digital Sky Survey**

3-7 Oct 2011

First Bi-national Meeting AAA-SOCHIAS. San Juan, Argentina.

## 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

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## Certifications

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

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

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## 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 and 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 **Scientific Assistant. EXPLORA and programa de investigación e innovación escolar IIE**, *National outreach programme and assessment of science and technology*.

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## Community service

- April **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. Chair of the LOC XIX SOCHIAS Annual Meeting.*
- 2023-present