

Pía Cortés-Zuleta

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<https://piacortes.github.io>

INTERESTS

Exoplanet detection and characterization - Stellar variability - M dwarfs - Transit Timing Variations - Machine learning methods - Software development - Outreach for unrepresented minorities in science

EDUCATION

PhD in Astrophysics - Aix-Marseille Université, FR	2019 - 2023
MSc in Astronomy - Universidad de Chile, CL	2017 - 2019
BSc in Astronomy - Universidad de Chile, CL	2011 - 2016

RESEARCH EXPERIENCE

University of St Andrews, UK

· Postdoctoral Research Fellow, supervisor: Prof. Andrew Cameron Aug 2023 - Present

Laboratoire d'Astrophysique de Marseille, FR

· Doctoral researcher, supervisor: Dr. Isabelle Boisse Oct 2019 - Jun 2023

Universidad de Chile, CL

· Graduate research assistant, supervisor: Dr. Patricio Rojo Mar 2017 - Sep 2019

Yale University, USA

· Visiting assistant in research, supervisor: Dr. Songhu Wang Apr - Jun 2018

HONOURS AND AWARDS

- LSSTC Data Science Fellowship Program - 2019
- Short-term Research Program grant, Universidad de Chile - 2018
- Adelina Gutiérrez scholarship, Chilean Astronomical Society (SOCHIAS) - 2017 and 2018
- La Serena School for Data Science scholarship - 2017

TECHNICAL TRAINING

- LSSTC Data Science Fellowship Program, 2019-2022
Six one-week sessions dedicated to software engineering, statistics, machine learning, data visualization, and data management.
- Exoplanets and Astrostatistical Analysis Techniques, Geneva Observatory, Switzerland, 2022
One-week state-of-the-art school of astrostatistical data analysis techniques in the field of exoplanet research.
- Astro Hack Week, Cambridge University, UK, 2019
One-week school focused on data visualization, software development, querying surveys, data management, machine learning, and Bayesian inference.
- La Serena School for Data Science Applied to Astronomy, La Serena, Chile, 2017
10-days school focused on image analysis, databases, statistical tools, machine learning, and cloud computing

OBSERVATIONAL EXPERIENCE

CO-I: SOPHIE consortium

- SOPHIE spectrograph, 1.93 m - Observatoire de Haute-Provence

CO-I: TraMoS, extending the southern follow-up of transiting exoplanets

- Du Pont telescope, 2.54 m - Las Campanas Observatory
- Danish telescope, 1.54 m - La Silla Observatory
- Swope telescope, 1 m - Las Campanas Observatory
- SMARTS telescope, 0.9 m - Cerro Tololo Inter-American Observatory

PI: Is WASP-77Ab alone in its system?

- Du Pont telescope, 2.54 m - Las Campanas Observatory
- Swope telescope, 1 m - Las Campanas Observatory

TEACHING EXPERIENCE

Universidad de Chile

- Instructor of Data Science in Astronomy. 2019, 2020
- Teaching Assistant of Astronomy and Planetary sciences, Introduction to Astrobiology, and Experimental methods in physics. 2013-2019
- Mentor of Summer research assistants and B.Sc students.

CONFERENCES

- Contributed talk, UK National Astronomy meeting. Virtual. July - 2022
- Poster, Cool Stars conference. Toulouse, France. July - 2022
- Contributed talk, CFHT users meeting. Strasbourg, France. May - 2022
- Poster, Gaussian Processes for radial velocities (GPRV) workshop. Oxford, UK. April - 2022
- [Interactive poster](#), TESS Science Conference II. Virtual, August - 2021
- Contributed talk, Semaine de l'Astrophysique Française (SF2A). Virtual, June - 2021
- Contributed talk, Second Binational AAA-SOCHIAS meeting. La Serena, Chile. October - 2018
- Poster, IAU Astrobiology research meeting. Coyhaique, Chile. November - 2017

OUTREACH AND SERVICE

- Founder of the “[Cazadoras de Estrellas](#)” project. We travel around Chile doing astronomy workshops for high school girls interested in astronomy and sciences. In 2019, we were shortlisted in the Nature Innovating Science award. ESO grant: \$25k.
- Vast experience in outreach talks for schools and general public in Chile, France, and online.
- Organizer of the first Planetary Systems Group (GSP) day held on October 2021.
- Organizer of the GSP Journal Club between 2020 and 2021.
- Member of the Outreach office of the Universidad de Chile between 2013 and 2019.
- Member of the organizing committee of the 2nd and 3rd Engineering and Sciences Festival of the Universidad de Chile, during 2014 and 2016.

SKILLS

Programming: Python (`pandas`, `scikit-learn`, `emcee`, `astropy`, among others), Arduino, Git
Languages: Spanish (native), English (fluent), French (beginner)

LIST OF PUBLICATIONS

First author:

1. *Optical and near-infrared stellar activity characterization of the early M dwarf Gl 205 with SOPHIE and SPIRou*
Cortés-Zuleta, P.; Boisse, I.; Klein, B.; et al. 2023, A&A, 673, A14. [arXiv:2301.10614](https://arxiv.org/abs/2301.10614)
2. *Transit Monitoring in the South V. Updated ephemeris and multi-epoch monitoring of the hot Jupiters WASP-18Ab, WASP-19b, and WASP-77Ab*
Cortés-Zuleta, P.; Rojo, P.; Wang, S.; Hinse, T. C.; Hoyer, S.; Sanhueza, S.; Correa-Amaro, P.; Alborno, J. 2020, A&A, 636, A98. [arXiv:2001.11112](https://arxiv.org/abs/2001.11112)

Co-author:

1. *A High-Eccentricity Warm Jupiter Orbiting TOI-4127.*
Gupta, A. F.; Jackson, J. M.; Hebrard, G.; et al. (including **Cortés-Zuleta, P.**), 2023, Accepted in AJ.
2. *CO or no CO? Narrowing the CO abundance constraint and recovering the H₂O detection in the atmosphere of WASP-127 b using SPIRou.*
Boucher, A.; Lafrenière, D.; Pelletier, S.; et al. (including **Cortés-Zuleta, P.**), 2023, Accepted in MNRAS.
3. *The SPIRou Legacy Survey Rotation period of quiet M dwarfs from circular polarization in near-infrared spectral lines: I. The SPIRou APERO analysis.*
Fouqué, P.; Martioli, E.; Donati J.F.; et al. (including **Cortés-Zuleta, P.**), 2023, Accepted in A&A.
4. *Near-IR and optical radial velocities of the active M-dwarf star Gl 388 (AD Leo) with SPIRou at CFHT and SOPHIE at OHP: A 2.23 days rotation period and no evidence for a co-rotating planet.*
Carmona, A.; Delfosse, X.; Bellotti, S.; **Cortés-Zuleta, P.**, 2023, Accepted in A&A.
5. *A sub-Neptune planet around TOI-1695 discovered and characterized with SPIRou and TESS.*
Kiefer, F.; Hébrard, G.; Martioli, E.; et al. (including **Cortés-Zuleta, P.**), 2023, A&A, 670, A136, 28.
6. *TOI-1452 b: SPIRou and TESS Reveal a Super-Earth in a Temperate Orbit Transiting an M4 Dwarf*
Cadieux, C.; Doyon, R.; Plotnyov, M.; et al. (including **Cortés-Zuleta, P.**), 2022, AJ, 164, 3, 96, 28.
7. *The HD 93963 A transiting system: A 1.04d super-Earth and a 3.65 d sub-Neptune discovered by TESS and CHEOPS*
Serrano, L. M.; Gandolfi, D.; Hoyer, S.; et al. (including **Cortés-Zuleta, P.**), 2022, A&A, 667, A1, 25.
8. *A warm super-Neptune around the G-dwarf star TOI-1710 revealed with TESS, SOPHIE and HARPS-N*
König, P. -C.; Damasso, M.; Hébrard, G.; et al. (including **Cortés-Zuleta, P.**), 2022, A&A, 666, A183, 17.
9. *TOI-1759 b: a transiting sub-Neptune around a low mass star characterized with SPIRou and TESS*
Martioli, E.; Hébrard, G.; Fouqué, P.; et al. (including **Cortés-Zuleta, P.**), 2022, A&A. 660, A86, 39.

10. *BEBOP III. Observations and an independent mass measurement of Kepler-16 (AB) b - the first circumbinary planet detected with radial velocities*
Triaud, A. H. M. J.; Standing, M. R.; Heidari, N.; et al. (including **Cortés-Zuleta, P.**), 2022, MNRAS, 511, 3, 3561-3570.
11. *HD207897 b: A dense sub-Neptune transiting a nearby and bright K-type star*
Heidari, N.; Boisse, I.; Orell-Mique, J.; et al. (including **Cortés-Zuleta, P.**), 2021, A&A, 658, A176, 17.
12. *TOI-1278 B: SPIRou Unveils a Rare Brown Dwarf Companion in Close-in Orbit around an M Dwarf*
Artigau, E.; Hébrard, G.; Cadieux, C.; et al. (including **Cortés-Zuleta, P.**), 2021, AJ, 162, 2, 144.
13. *TOI-1296b and TOI-1298b observed with TESS and SOPHIE: two hot Saturn-mass exoplanets with different densities around metal-rich stars*
Moutou, C.; Almenara, J. M.; Hébrard, G.; et al. (including **Cortés-Zuleta, P.**), 2021, A&A, 653, A147, 12.
14. *TOI-220 b: a warm sub-Neptune discovered by TESS*
Hoyer, S.; Gandolfi, D.; Armstrong, D. J.; et al. (including **Cortés-Zuleta, P.**), 2021, MNRAS, 505, 3, 3361-3379.
15. *The SOPHIE search for northern extrasolar planets. XVII. A wealth of new objects: Six cool Jupiters, three brown dwarfs, and 16 low-mass binary stars*
Dalal, S.; Kiefer, F.; Hébrard, G.; et al. (including **Cortés-Zuleta, P.**), 2021, A&A, 651, A11, 27.
16. *TOI-132 b: A short-period planet in the Neptune desert transiting a $V = 11,3$ G-type star*
Díaz, M. R.; Jenkins, J. S.; Gandolfi, D.; Lopez, E. D.; Soto, M. G.; **Cortés-Zuleta, P.**; et al. 2020, MNRAS, 493, 1, 973-985.
17. *An ultrahot Neptune in the Neptune desert*
Jenkins, J. S.; Diaz, M. R.; Kurtovic, N. T.; Espinoza, N.; Peña, P.; Brahm, R.; Torres, P.; **Cortés-Zuleta, P.**; et al. 2020, Nature Astronomy, 4, 1148-1157.
18. *The diffuse molecular component in the nuclear bulge of the Milky Way.*
Riquelme, D.; Bronfman, L.; Mauersberger, R.; Finger, R.; Henkel, C.; Wilson, T. L.; **Cortés-Zuleta, P.**. 2018, A&A, 610, A43.
19. *Solving the conundrum of intervening strong MgII absorbers towards GRBs and QSOs.*
Christensen, L.; Vergani, S.; Schulze, S.; et al. (including **Cortés-Zuleta, P.**) et al. 2017, A&A, 608, A84.