

# Pía Cortés-Zuleta

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<https://piacortes.github.io>

## INTERESTS

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Exoplanet detection and characterization – Stellar variability – Low-mass stars – Machine learning methods - Gaussian Processes – Outreach for unrepresented minorities in science

## EDUCATION

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

## RESEARCH EXPERIENCE

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<b>University of St Andrews, UK</b> · Postdoctoral Research Fellow, supervisor: Prof. Andrew Collier Cameron	Aug 2023 - Present
<b>Laboratoire d'Astrophysique de Marseille, FR</b> · Doctoral researcher, supervisor: Dr. Isabelle Boisse	Oct 2019 - Jun 2023
<b>Universidad de Chile, CL</b> · Graduate research assistant, supervisor: Prof. Patricio Rojo	Mar 2017 - Sep 2019
<b>Yale University, USA</b> · Visiting assistant in research, supervisor: Dr. Songhu Wang	Apr - Jun 2018

## HONOURS AND AWARDS

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- 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

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- LSSTC Data Science Fellowship Program, 2019-2022
- Exoplanets and Astrostatistical Analysis Techniques, Geneva Observatory, Switzerland, 2022
- Astro Hack Week, Cambridge University, UK, 2019
- La Serena School for Data Science Applied to Astronomy, La Serena, Chile, 2017

## OBSERVATIONAL EXPERIENCE

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### 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

## TEACHING AND SUPERVISION EXPERIENCE

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### University of St Andrews

- Co-supervisor of MSc students: Thomas Mitchell, Abby Burden 2024, 2025
- Lecturer of Contemporary Astrophysics (10 lectures). 2025
- Demonstrator of Computational Astrophysics. 2024, 2025

### 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.

## TALKS AND CONFERENCES

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- Poster, UKEXOM. Leeds, April 2025
- Contributed talk, Scottish Exoplanets meeting. University of Edinburgh, January 2025
- Contributed talk, PLATO conference. Virtual, October 2024
- Poster, Exoplanets V. Leiden, June 2024
- Contributed talk, PLATO Stellar variability working group meeting. University of Oxford, March 2024
- Invited talk, SPIMAX seminar. University of Oxford, November 2023
- Contributed talk, SPIRou workshop. Virtual. October - 2023
- 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

## OUTREACH AND SERVICE

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- 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

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

## LIST OF PUBLICATIONS

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First author:

1. *Gl 725A b: a potential super-Earth detected with SOPHIE and SPIRou in an M dwarf binary system at 3.5 pc*  
**Cortés-Zuleta, P.**; Boisse, I.; Ould-Elhkim, M.; et al. 2025, A&A, 693, A164. [arXiv:2411.09506](#)
2. *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](#)
3. *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](#)

Co-author:

1. *Characterizing planetary systems with SPIRou: Detection of a sub-Neptune in a 6-day period orbit around the M dwarf Gl 410*  
Carmona, A.; Delfosse, X.; Ould-Elhkim, M.; **Cortés-Zuleta, P.** et al., 2025, Accepted in A&A.
2. *Characterization of seven transiting systems, including four warm Jupiters from SOPHIE and TESS.*  
Heidari, N.; Hébrard, G.; Martioli, E. et al. (including **Cortés-Zuleta, P.**), 2025, A&A, 694, A36.
3. *Characterising planetary systems with SPIRou: Temperate sub-Neptune exoplanet orbiting the nearby fully convective star GJ 1289 and a candidate around GJ 3378.*  
Moutou, C.; Ould-Elhkim, M.; Donati, J. -F. et al. (including **Cortés-Zuleta, P.**), 2024, A&A, 688, A196.
4. *A low-mass sub-Neptune planet transiting the bright active star HD 73344.*  
Sulis, S.; Crossfield, I. J. M.; Santerne, A. et al. (including **Cortés-Zuleta, P.**), 2024, A&A, 688, A14.
5. *BEBOP V. Homogeneous stellar analysis of potential circumbinary planet hosts.*  
Freckelton, A. V.; Sebastian, D.; Mortier, A. et al. (including **Cortés-Zuleta, P.**), 2024, MNRAS, 531, 4
6. *Planet Hunters TESS. V. A Planetary System Around a Binary Star, Including a Mini-Neptune in the Habitable Zone.*  
Eisner, N. L.; Grunblatt, S. K.; Barragán, O. et al. (including **Cortés-Zuleta, P.**), 2024, AJ, 167, 5, 241.
7. *TOI-1199 b and TOI-1273 b: Two new transiting hot Saturns detected and characterized with SOPHIE and TESS.*  
Serrano Bell, J.; Díaz, R. F.; Hébrard, G. et al. (including **Cortés-Zuleta, P.**), 2024, A&A, 684, A6
8. *The EBLM Project- XI. Mass, radius, and effective temperature measurements for 23 M-dwarf companions to solar-type stars observed with CHEOPS.*  
Swaine, M. I.; Maxted, P. F. L.; Triard, A. H. M. J. et al (including **Cortés-Zuleta, P.**), 2024, MNRAS, 528, 4.
9. *A hot mini-Neptune and a temperate, highly eccentric sub-Saturn around the bright K-dwarf TOI-2134.*  
Rescigno, F.; Hébrard, G.; Vanderburg, A. et al. (including **Cortés-Zuleta, P.**), 2024, MNRAS, 527, 3.

10. *The SOPHIE search for northern extrasolar planets: XIX. A system including a cold sub-Neptune potentially transiting a  $V = 6.5$  star HD 88986.*  
Heidari, N.; Boisse, I.; Hara, N. C. et al. (including **Cortés-Zuleta, P.**), 2024, A&A, 681, A55.
11. *TOI-1736 and TOI-2141: Two systems including sub-Neptunes around solar analogs revealed by TESS and SOPHIE.*  
Martioli, E.; Hébrard, G.; de Almeida, L. et al. (including **Cortés-Zuleta, P.**), 2023, A&A, 680, A84.
12. *Characterizing planetary systems with SPIRou: M-dwarf planet-search survey and the multiplanet systems GJ 876 and GJ 1148.*  
Moutou, C.; Delfosse, X.; Petit, A. C. et al. (including **Cortés-Zuleta, P.**), 2023, A&A, 678, A207.
13. *Two warm Neptunes transiting HIP 9618 revealed by TESS and Cheops.*  
Osborn, H. P.; Nowak, G.; Hébrard, G. et al. (including **Cortés-Zuleta, P.**), 2023, MNRAS, 523, 2.
14. *A High-Eccentricity Warm Jupiter Orbiting TOI-4127.*  
Gupta, A. F.; Jackson, J. M.; Hébrard, G.; et al. (including **Cortés-Zuleta, P.**), 2023, AJ, 165, 6, 234.
15. *CO or no CO? Narrowing the CO abundance constraint and recovering the H<sub>2</sub>O detection in the atmosphere of WASP-127 b using SPIRou.*  
Boucher, A.; Lafrenière, D.; Pelletier, S.; et al. (including **Cortés-Zuleta, P.**), 2023, MNRAS, 522, 4.
16. *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, A&A, 672, A52.
17. *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, A&A, 674, A110.
18. *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.
19. *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.
20. *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.
21. *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.
22. *TOI-1759 b: a transiting sub-Neptune around a low mass star characterized with SPIRou and TESS*

- Martoli, E.; Hébrard, G.; Fouqué, P.; et al. (including **Cortés-Zuleta, P.**), 2022, A&A. 660, A86, 39.
23. *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.
  24. *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.
  25. *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.
  26. *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.
  27. *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.
  28. *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.
  29. *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.
  30. *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.
  31. *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.
  32. *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.