

Curriculum Vitae

Pablo A. Peña Rojas

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RESEARCH INTERESTS

- Exoplanet Detection and Characterisation
- Radial Velocities and Astrometry
- Jupiter Analogues
- Bayesian Inference and Noise Modelling
- Sampling Algorithms – MCMC

EDUCATION

- 2013 - 2018 B.S. in Astronomy at **Universidad de Chile**
- 2019 - 2021 PhD (Astronomy) at **Universidad de Chile** (*programme change to UDP*)
- 2022 - 2026 PhD (Astrophysics) at **Universidad Diego Portales**, defense on January 5th.

TEACHING EXPERIENCE

- Physics and Maths Coaching** 2014-2018
Tutoring classes For Maths Olympiads and SATs.
- Postgrad Tutoring Classes** 2018
Tutoring classes Tutored Master's students in statistics and programming.
- Teaching Assistant** 2019-2021
Universidad de Chile, Departamento de Astronomía
 Physics and astronomy courses.
- Teaching Assistant** 2022-2025
Universidad Diego Portales, General Courses Worlds in the Galaxy CFG.
- Practice co-guide for undergrads** 2019-2020
Universidad de Chile, Departamento de Astronomía
 Co-guided five undergraduate students during their 3-month summer research projects in astronomy.
- Observatory Tour-Guide** 2019
Observatorio Astronómico Nacional Tour guide for schools and general public at the OAN.
- Post-Seminar Talk Coordinator** 2019
Universidad de Chile, Departamento de Astro-nomía
 Organised and coordinated an informal gathering for students to talk with the weekly seminar speakers over pizza. Since most speakers were from abroad, this provided a great opportunity for students to gain diverse perspectives.

Code&Cookies Organiser	2021
<i>Universidad Diego Portales</i>	By-weekly 1-hour student meeting/workshop to share computational tools.
Mentoring of Fulbright Fellow (informal)	2023
<i>Rafael Rubenstein</i>	At Universidad Diego Portales.
Mentoring of PhD student (informal)	2023
<i>Florence De Almeida</i>	At Universidad Diego Portales.
Mentoring of PhD student (informal)	2025
<i>Joanne Rojas</i>	At Universidad Diego Portales.

PROJECTS

reddemcee	readthedocs.io
A fast Adaptive Parallel Tempering MCMC Sampler, with next-generation temperature-ladder adaptation techniques, and novel Bayesian evidence estimation methods. Open-source pip-installable Python library.	

emperor	readthedocs.io
EMPEROR is a modular framework designed for efficient automatised detection and characterisation of exoplanets with RV data and absolute astrometry, with systematic model comparison and publication-ready visualisations. It supports <code>dynesty</code> [0] and <code>reddemcee</code> , moving averages and Gaussian Processes, multi-instrument, and multi-planet modelling.	

reddutils	GitHub
Astronomy utilities with GUIs in Python, for pedagogical and research purposes. It includes tools for 1) correlations, 2) periodograms, 3) exoplanet population plotting, and 4) Fourier transforms visualisation sliders	

fast_kepler	GitHub
A c implementation for solving Kepler's equation. It natively allows several different parameterisations.	

SKILLS

Languages	English (Fluent), Español (Native), Deutsch (A1), Português (basic).
Programming	Extensive knowledge of PYTHON, MATLAB, LATEX. Intermediate knowledge of C, R, FORTRAN, IDL, html, and JavaScript.
Software	Excel, Canva, DaVinci Resolve, Photoshop, InDesign, Figma, Overleaf

ADDITIONAL EXPERIENCE

Programming Assistant	2016
<i>Observatorio Cerro Calán</i>	Programming assistant for software development for two semesters.
Programmer	2017
<i>University Program</i>	Machine Learning Algorithm development for the classification of hyper-spectral images in soil samples, for the mining industry.
Geotechnic Developer	2019
<i>IMG Ltda Investigaciones Mineras y Geologicas</i> – Development of GNN for the automatised detection of catastrophic events.	
Programmer	2019
<i>Observatorio Cerro Calán</i> – Document pipeline for Master's Program CNA Acreditation Process.	
Server Infrastructure Engineering	2022
<i>Centro de Astronomía y Tecnologías Afines</i> –	Budgeted, designed and built a shared research server for exoplanet data analysis for New Worlds Lab .

SEMINARS AND CONFERENCES

SOCHIAS 2017	2017
<i>Marbella Resort, Maitencillo, Chile</i> –	Poster contribution.
EPRV 5	2023
<i>Santa Barbara, CA, USA</i> –	Poster Contribution.
ICEPF 5	soon (2025)
<i>Shanghai</i> –	Poster Contribution.
Research Seminar - reddemcee	11-2023
<i>Instituto de Estudios Astrofísicos, UDP</i>	Research seminar, invited talk.
IR Seminar - EMPEROR	4-2024
<i>Astrobiology Center, NAOJ</i>	Research seminar, contributed talk.
UDP Jamboree - EMPEROR	9-2024
<i>Instituto de Estudios Astrofísicos, UDP</i>	Research seminar, invited talk.
Welcome Day	05-2025
<i>Universidad Diego Portales - Postgrad Department</i>	Discussion Panellist.
Extended Research Visit	2024
<i>Tsung-Dao Lee Institute, Shanghai Jiao Tong University, China</i> –	3 month research visit.

ACCEPTED TELESCOPE PROPOSALS (AS PI)

FT2022B-12	Euler Swiss telescope, 6 nights
CN2023A-51	Euler Swiss telescope, 10 nights
FT2023A-51	Euler Swiss telescope, 4 nights
CN2023B-64	Euler Swiss telescope, 10 nights
FT2023B-08	Euler Swiss telescope, 1 night
CN2024A-42	Euler Swiss telescope, 8 nights
CN2025A-74	Euler Swiss telescope, 4 nights
CN2025B-93	Euler Swiss telescope, 7 nights

ACCEPTED TELESCOPE PROPOSALS (AS Co-I)

CN2023A-69	SMARTS 1.5-m CHIRON, 40 hours
CN2023A-52	SMARTS 1.5-m CHIRON, 75 hours
CN2023B-29	SMARTS 1.5-m CHIRON, 50 hours
CN2023B-32	SMARTS 1.5-m CHIRON, 50 hours
CN2024A-50	EULER 1.2-m CORALIE, 5 nights
CN2024B-4	EULER 1.2-m CORALIE, 8 nights
CN2025A-16	EULER 1.2-m CORALIE, 2 nights
ESO 117.2A5M	HARPS
ESO 117.2A5J	Chiron&HARPS
ESO 117.2A5D	ESPRESSO&HARPS
ESO 117.2A5H	ESPRESSO
ESO 116.28YF	ESPRESSO
ESO 116.28YA	HARPS
ESO 116.28Z0	HARPS
ESO 116.28YZ	ESPRESSO&HARPS
ESO 115.27YY	HARPS
ESO 115.287C	HARPS
ESO 115.2873	ESPRESSO&HARPS
ESO 114.28HN	ESPRESSO
ESO 114.27CC	NIRPS
ESO 114.27C0	HARPS
ESO 113.26HQ	HARPS
ESO 113.26GX	HARPS
ESO 112.25QD	HARPS
ESO 111.24T6	HARPS
ESO 110.2413	HARPS
ESO 109.2374	HARPS
ESO 108.22FQ	ESPRESSO
ESO 108.22DQ	HARPS
ESO 108.22DN	ESPRESSO
ESO 106.21GV	ESPRESSO
ESO 06.21H1	HARPS