

POSTGRADOS **UDP**

PHD IN

ASTROPHYSICS

udp FACULTAD DE
INGENIERÍA Y CIENCIAS



DESCRIPTION

The Ph.D. in Astrophysics seeks to train astronomers who are capable of carrying out original and independent research, contributing to the advancement of the discipline. Students graduating from the program are expected to publish their work in specialized journals and continue their careers in research institutions, such as prestigious universities and world-class astronomical observatories.

The program is designed with a strong emphasis on research activities from the first semester and to capitalize on the enormous comparative advantages that Chile has for the development of observational astronomy. Chile is currently home to the largest collection of telescopes in the world. Considering the new generation of mega-telescopes under construction

to be installed in the country (E-ELT, GMT, and LSST), the Chilean territory will concentrate about 70% of the ground-based astronomical infrastructure worldwide. Access to this frontier astronomical instrumentation represents a unique opportunity for our students. Given the very high profile that astrophysics in Chile has reached at a global level, the Ph.D. program is designed to be highly international and flexible enough to adjust to the characteristics and needs of students coming from different regions of the world.

OBJECTIVES OR LINES OF RESEARCH

I.

Astrophysics of Planetary Systems

Planetary formation, protoplanetary disks, extrasolar planets, cosmic dust laboratory.

II.

Stellar and Galactic Astrophysics

Evolution of stars, stellar populations and abundance, galactic dynamics, galactic archaeology, galactic transients.

III.

Extragalactic Astrophysics

Galactic evolution over cosmic time, extragalactic transients, active galactic nuclei, supermassive black holes, dwarf galaxies, extragalactic stellar populations.

STRUCTURE OF THE PROGRAM

| COURSEWORK STAGE | |
|------------------------------------------------------|------------|
| I SEMESTER | |
| Stellar and Galactic Astrophysics | 8 credits |
| Research Assignment I | 16 credits |
| Topics in Astrophysics I (colloquium/astro-ph) | 6 credits |
| II SEMESTER | |
| Astrophysics of Planetary Systems or optional course | 8 credits |
| Research Assignment II | 16 credits |
| Topics in Astrophysics II (colloquium /astro-ph) | 6 credits |
| III SEMESTER | |
| Extragaláctica Astrophysics or optional course | 8 credits |
| Thesis Project | 16 credits |
| Topics in Astrophysics III (colloquium /astro-ph) | 6 credits |
| QUALIFYING EXAM | |

THESIS STAGE

IV SEMESTER

Doctoral Thesis I

30 credits

V SEMESTER

Doctoral Thesis II

30 credits

VI SEMESTER

Doctoral Thesis III

30 credits

VII SEMESTER

Doctoral Thesis IV

30 credits

VIII SEMESTER

Doctoral Thesis V

30 credits

THESIS DEFENSE

FACULTY

MANUEL ARAVENA

Ph.D. in Astronomy, 2009. University of Bonn and the Max-Planck Institute for Radioastronomy, Germany. Postdoctoral researcher at the National Radio Astronomy Observatory in Charlottesville, USA (2009-2011); European Southern Observatory (ESO) Fellow in Santiago, Chile (2011-2014). Faculty member at UDP since 2014. Member of the Science Advisory Committee of ALMA 2016-2019. Publications and research projects: 86 ISI/WoS with >2600 citations; H-index=30. Lead author on 12 papers, with >300 citations.

Main research interests: Stellar formation and the interstellar medium in galaxies, submillimeter galaxies, radioastronomy and submillimeter observation.

Area of the doctoral program: Extragalactic astrophysics .

ROBERTO ASSEF

Ph.D. in Astronomy, 2010, The Ohio State University, USA. NASA Postdoctoral Program Fellow, Jet Propulsion Laboratory (2010-2013). Faculty member at UDP since 2013. Director of the Astronomy Nucleus at the UDP since 2017. Has published more than 90 ISI-WoS articles, with over 4,500 total citations. H-index=41. Lead author on 12 ISI/WoS papers (ApJ, ApJL, ApJS), with over 700 total citations.

Main research interests: Nuclei of active galaxies, supermassive black holes and the evolution of galaxies.

Area of the doctoral program: Extragalactic astrophysics.

LUCAS CIEZA

Ph.D. in Astronomy, 2007, University of Texas at Austin, USA. Spitzer and Sagan Fellow (NASA), University of Hawaii (2007-2013). Faculty member at UDP since 2013. Director of the Astronomy Nucleus during 2015 and 2016. Director of the Doctoral Program in Astrophysics. Has published over 100 papers ISI/WoS papers, with >5,000 citations. H-Index = 40. Lead author on 18 ISI/WoS papers (ApJ, ApJL, MNRAS, Nature) with >900 citations.

Main research interests: Protoplanetary Disks and planetary formation. Cosmic Dust Laboratory.

Area of the doctoral program: Astrophysics of planetary systems.

PAULA JOFRÉ

Doctor in Natural Sciences, 2010, Ludwig Maximilian University and the Max Planck Institute for Astrophysics, Germany. Post-doctoral researcher at the Laboratoire d'Astrophysique of Bordeaux, France (2011-2013), and at the Institute of Astronomy, University of Cambridge, England (2013-2017). Member of King's College, Cambridge (2015-present). Faculty member at UDP since 2017. Has published more than 90 ISI/WoS papers with a total of >4,300 citations. H-Index=29. Lead author on 12 ISI/WoS papers, with > 350 citations.

Main research interests: Stellar astrophysics and the formation y evolution of the Milky Way.

Area of the doctoral program: Stellar and galactic astrophysics.

EVELYN JOHNSTON

Ph.D. in Astronomy, 2015, University of Nottingham, UK. ESO fellow in Chile with duties at Paranal observatory (2014-2018), and FONDECYT Fellow at the Pontificia Universidad Católica de Chile (2018-2021). Faculty member at UDP since 2021. Has published more than 18 ISI/WoS papers with a total of >820 citations. H-Index=7. Lead author on 10 ISI/WoS papers.

Main research interests: Galaxy evolution, dwarf galaxies, SO galaxies, transformation of galaxy morphology, extragalactic stellar populations.

Area of the doctoral program: Extragalactic astrophysics, stellar astrophysics.

JOSÉ LUIS PRIETO

Ph.D. Astronomy, 2009, Ohio State University, USA. Hubble (NASA) and Carnegie-Princeton Fellow, Carnegie Observatories (2009-2011) and Princeton University (2011-2014). Faculty member at UDP since 2014. Has published more than 160 ISI/WoS papers, with >9,500 citations. H-Index= 51. Lead author on 11 ISI/WoS papers (ApJ and ApJL) with >665 citations.

Main research interests: Supernova explosions, massive stars, transient objects and variable stars.

Area of the doctoral program: Stellar and galactic astrophysics; extragalactic astrophysics.

FACULTY

CLAUDIO RICCI

Ph.D. in Astronomy, 2011, Université de Genève, Switzerland. JSPS Fellow, Kyoto University (2012-2014); Postdoctoral Fellow, Pontificia Universidad Católica de Chile (2015-2016); China/Conicyt fellow (2016-2018). Faculty member at UDP since 2018. Has published more than 96 ISI/WoS papers, with >1,700 citations. H-Index=24. Lead author on 15 ISI/WoS papers (ApJ, ApJL, ApJS, MNRAS, A&A, Nature) with >550 citations.

Main research interests: Supermassive black holes, evolution of galaxies, high-energy astrophysics.

Area of the doctoral program: Extragalactic astrophysics.

ALICE ZURLO

Ph.D. in Astronomy, 2015, Università degli Studi di Padova, Italy. Postdoctoral scholarship at the Universidad Diego Portales (2015-2018), initially with the Protoplanetary Disks 'Núcleo Milenio' project and later under the postdoctoral program of national research funding agency FONDECYT. Faculty member at UDP since 2018. Has published more than 60 ISI/WoS papers, 50 of them in the past 3 years. H-Index = 22, with >1,300 citations. Member of the VLT/SPHERE. disk and planetary detection team.

Main research interests: Exoplanets and protoplanetary disks, direct imaging technique, high resolution and high contrast imaging and electroscopy, low mass companions.

Area of the doctoral program: Astrophysics of planetary systems.

APPLICANT PROFILE

The program is aimed at applicants holding a bachelor's or master's degree in astronomy or related fields (physics, planetary sciences, etc.). Applicants are expected to have excellent grades in their previous studies, some experience in research projects, and a very high level of motivation for astronomy research. Applicants must also have a good command of the English language (reading comprehension is essential and oral and written expression highly desirable) and be in a position to dedicate full-time to the Ph.D. program.

APPLICATION DOCUMENTS

- Cover letter explaining motivation for entering the Ph.D. program and research interests.
- Curriculum vitae.
- Copy of undergraduate academic transcripts (graduate transcripts too, if available).
- Copy of undergraduate and/or graduate degrees or letter from University official indicating expected graduation date.
- A minimum of two and a maximum of three letters of recommendation.

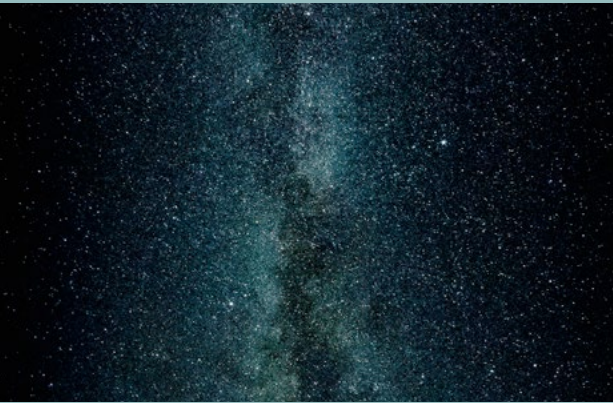
FURTHER INFORMATION


Lucas Cieza, Program Director


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udp.cl

POSTGRADOS UDP



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|  Comisión Nacional de Acreditación CNA-Chile | 5 AÑOS | UNIVERSIDAD ACREDITADA EN TODAS LAS ÁREAS |
| | Gestión Institucional, Docencia de Pregrado, Investigación, Docencia de Postgrado y Vinculación con el Medio Desde octubre de 2018 hasta octubre de 2023. | |

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|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|  Comisión Nacional de Acreditación CNA-Chile | 3 AÑOS | Doctorado en Astrofísica ACREDITADO |
| | <small>Desde diciembre de 2019 hasta diciembre de 2022. Organismo Acreditador: Comisión Nacional de Acreditación. Modalidad: Presencial Sede: Santiago Jornada: Diurna.</small> | |