# Néstor Espinoza

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## Education

**Pontificia Universidad Católica de Chile (PUC)** 2012 — present
Ph. D. in Astrophysics
(expected graduation: June, 2017)

**Pontificia Universidad Católica de Chile (PUC)** 2007 — 2012
Licenciate in Astronomy (*summa cum laude*)
Advisor: Dr. Andrés Jordán

## Fellowships & Awards

**PUC Young Student Leader** 2016
Yearly recognition given to 20 students from the university

**Kavli Summer Program in Astrophysics Fellowship** 2016
Granted to 17 PhD students around the world

**People's Choice Award** 2014
Awarded at the Three Minute Thesis® Competition at PUC

**Distinguished Graduate Student Award** 2014
Yearly award granted by the Chilean Astronomical Society

**CONICYT Graduate Research Fellowship** 2013—present
Granted by the Chilean Ministry of Education

## Professional Experience

**Research assistant: automated data reduction of astronomical data** 2016
Implemented codes that download data from telescopes around the world (the LCOGT network of automated telescopes) in a daily basis, reduces the data and sends the reduced products via e-mail to collaborators around the world, including summary plots. This greatly improved the efficiency of the work being done with the telescopes, which involves the discovery of astronomical transients and, as such, requires fast and accurate interpretation of the data in order to adjust the follow-up capabilities on a daily basis.

**Research assistant: web platform for automated reduction of astronomical data** 2014-2015
Implemented a web server in Django in order to allow users to register and upload raw astronomical data, which is reduced in the background and the results sent via e-mail to each user. This greatly improved the efficiency of the reduction of the astronomical data at hand, which can be reduced as soon as the data is obtained (in contrast, in the past the data had to be sent to a human expert, which would take days to weeks in order to find time to reduce the data).

**Research assistant: automated classification of variable stars** 2012-2014
Implemented Machine Learning algorithms in order to find the best to classify thousands of astronomical time-series of stars in order to classify the objects depending on their variability types. This initial work, done on a subset of the data, laid the groundwork for an academic publication that allowed the classification of the full dataset (see Elorrieta et al., 2016).

## Publications

To date, I have published six articles as **first author**, **co-authored** more than 30 publications in total (see full publication list following this link). List of first author publications:

1. "*Metal enrichment leads to low atmospheric C/O ratios in transiting giant exoplanets*"
   **Espinoza, N.**, Fortney, J., Miguel, Y., et al., 2016, submitted to ApJL (eprint arXiv:1611.08616).
2. "*EPIC 220504338b: A dense hot-Jupiter transiting a solar analogue*"
   **Espinoza, N.**, Rabus, M., Brahm, R., et al., 2016, submmited to MNRAS (eprint arXiv:1611.07614).
3. "*Discovery and Validation of a High-Density sub-Neptune from the K2 Mission*"
   **Espinoza, N.**, Brahm, R., Jordán, A., et al., 2016, ApJ, 830, 43.
4. "*HATS-25b through HATS-30b: A Half-dozen New Inflated Transiting Hot Jupiters from the HATSouth Survey*"
   **Espinoza, N.**, Bayliss, D., Hartman, J., et al., 2016, AJ, 152, 108.
5. "*Limb-darkening and exoplanets II: Choosing the Best Law for Optimal Retrieval of Transit Parameters*"
   **Espinoza, N.** & Jordán, A., 2016, MNRAS, 457, 3573.
6. "*Limb-darkening and exoplanets: testing stellar model atmospheres and identifying biases in transit parameters*"
   **Espinoza, N.** & Jordán, A., 2015, MNRAS, 450, 1879.

## Technology summary

**Python, C, Javascript, Java, MySQL, PHP, HTML, Unix, Linux, Mac OS X**

## Invited Talks

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|---|---|
| Stars and Planets Seminar, Harvard-Smithsonian CfA, USA | 11/2016 |
| Disks and Planets Seminar, Universidad Diego Portales, Chile | 08/2016 |
| Kavli Summer Program Seminar, UCSC, USA | 07/2016 |
| Planet and Star Formation Coffee Talk, MPIA, Germany | 07/2015 |
| Instituto de Astrofísica de Canarias Seminar, Spain | 07/2015 |
| Joint OSU-PUC Workshop, Ohio State University, USA | 05/2014 |
| ORIGINS Seminar, Center for Astrobiology, University of Arizona, USA | 03/2014 |
| XI Chilean Astronomical Society Annual Science Meeting, Chile | 01/2014 |
| First International Meeting in Astrostatistics in Valparaiso, Chile | 05/2013 |

## Outreach

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|---|---|
| Weekly astronomy show on chilean national radio station "Futuro FM"<br>Audience: +30k/week (source: Iberoamericana Radio Chile) | 2015—present |
| Monthly astronomy blog at the "Telescopios Chile" web portal | 2015—present |
| Public lecture: "Planetary transits: 400 years discovering new worlds"<br>2016 Transit of Mercury day, PUC, Chile | 05/2016 |
| Public lecture: "Light: an electric and magnetic relationship"<br>EXPLORA-CONICYT National Science Week, Chile | 10/2015 |
| Lecture for school teachers: "Hands-on spectroscopy with the SDSS"<br>Given yearly at the National Astronomy Olympiads, Chile | 2012—2015 |
| Invited jury at the VI National Astronomy Olympiads, Chile | 07/2014 |
| Several ($\sim$ 2 per semester) talks at chilean schools | 2012—present |
| Founder and Coordinator of the "Bling Bling Universe" astronomy initiative | 2009—2015 |
| Director of the "Itinerant Physics" outreach program | 2009—2013 |

## Teaching and Mentoring

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| **Teacher, Center of Study and Development of Talent, Penta UC**<br>Course: "Orders of Magnitude" (50 hours per course) | 2014A, 2014B, 2016A |
| **Invited Lecturer, Faculty of Economics and Business, U. de Chile**<br>Course: "Introduction to Science" (one lecture per semester) | 2016A, 2016B |

**Teaching Assistant**:

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|---|---|
| ASP5408: Statistics for Astronomers (PUC) | 2012—2016 |
| AST0421: Experimental Astrophysics (PUC) | 2014B |
| AST0212: Introduction to Data Analysis (PUC) | 2014A |
| AST1525: Putting Numbers to the Earth and the Universe (PUC) | 2014A |
| AST0311: General Astrophysics (PUC) | 2013A |
| FIS101M: General Physics for the Military School (PUC) | 2011B |
| FIS120: Electricity & Magnetism (Univ. Técnica Federico Santa María) | 2010—2011 |

**Student mentorship**:

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|---|---|
| Roy Van der Westhuizen (Undergraduate Thesis), PUC<br>Title: "An interactive virtual exoplanet laboratory: APIastro" | 2015B |
| Victoria A. Villar (Summer Program), MIT-PUC<br>Title: "Limb darkening and transiting planets" | 2015A |