

# Dr. Néstor Espinoza

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## Appointments

<b>Mission Scientist for Exoplanet Science</b> Space Telescope Science Institute Baltimore, USA	2023A — present
<b>Associate Astronomer</b> Space Telescope Science Institute Baltimore, USA	2024A — present
<b>Associate Research Scientist</b> Johns Hopkins University Baltimore, USA	2020B — present
<b>Assistant Astronomer</b> Space Telescope Science Institute Baltimore, USA	2019B — 2024A
<b>Bernoulli Postdoctoral Fellow</b> Max-Planck Institut für Astronomie Heidelberg, Germany	2017B — 2019A

## Education

<b>Pontificia Universidad Católica de Chile (PUC)</b> Ph. D. in Astrophysics ( <i>summa cum laude</i> ) Advisor: Dr. Andrés Jordán	2012 — 2017
<b>Pontificia Universidad Católica de Chile (PUC)</b> Licenciate in Astronomy ( <i>summa cum laude</i> ) Advisor: Dr. Andrés Jordán	2007 — 2012

## Fellowships & Awards

<b>2023 AURA Science Award</b> Institute-wide recognition for “ <i>outstanding contributions to the characterization of exoplanet atmospheres through transit spectroscopy</i> ”.	2024
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<b>NASA Silver Group Achievement Award</b>	2024
Administration-wide recognition to the JWST Instrument Commissioning Team for “ <i>outstanding expertise and tireless dedication to commission the world-class instruments and subsystems of JWST, producing never-before-seen images of the universe</i> ”.	
<b>IAU-Gruber Fellowship</b>	2018
Fellowship awarded by The Gruber Foundation, selected by the International Astronomical Union (IAU, 25,000 USD prize for research).	
<b>Bernoulli Fellowship</b>	2017— 2019
Joint position between the Max-Planck-Institut für Astronomie (MPIA) and the University of Bern.	
<b>100 Young Chilean Leaders</b>	2017
Selected as one of the 100 leaders under 35 by El Mercurio newspaper.	
<b>Adelina Gutiérrez Travel Grant</b>	2017
Research stipend awarded by the Chilean Astronomical Society.	
<b>PUC Young Student Leader</b>	2016
Yearly recognition given to 20 students from the university.	
<b>Kavli Summer Program in Astrophysics Fellowship</b>	2016
Granted to 17 PhD students around the world.	
<b>People’s Choice Award</b>	2014
Awarded at the Three Minute Thesis® Competition at PUC.	
<b>Distinguished Graduate Student Award</b>	2014
Yearly award granted by the Chilean Astronomical Society.	
<b>CONICYT Graduate Research Fellowship</b>	2013—2017
Fellowship awarded by the Chilean Ministry of Education.	

## Grants

As PI or co-PI (total: 1M+ USD):

<b>JWST Cycle 4 General Observers (GO) Program</b>	2025 — present
200,000+ USD cap to the project “Using stellar contamination proxy TRAPPIST-1 b to search for an atmosphere on TRAPPIST-1 e” (co-PIs: Allen & Espinoza; GO 9256)	
<b>JWST Cycle 3 General Observers (GO) Program</b>	2024B — present
90,000+ USD awarded to the project “Using stellar contamination proxy TRAPPIST-1 b to search for an atmosphere on TRAPPIST-1 e” (co-PIs: Allen & Espinoza; GO 6456)	

<b>JWST Cycle 2 General Observers (GO) Program</b> 260,000+ USD awarded to the project “Hot Jupiter Atmospheric Forecast: Are mornings cloudier than evenings in other worlds?” (co-PIs: Espinoza & Powell; GO 3969)	2023B — present
<b>JWST Cycle 1 General Observers (GO) Program</b> 160,000+ USD awarded to the project “The First Near-infrared Spectroscopic Phase-curve of a Super-Earth” (PI: Espinoza; GO 2159)	2021B — present
<b>JWST Cycle 1 General Observers (GO) Program</b> 150,000+ USD awarded to the project “Exploring the Morning and Evening Limbs of a Transiting Exoplanet” (PI: Espinoza; GO 2113)	2021B — present
<b>STScI Director’s Discretionary Funds (DDRF)</b> 45,000+ USD awarded to the project “Supporting Early Career Scientists & the JWST Workshop for 2023 Spring Symposium” (PI: Espinoza).	2022B — present
<b>STScI Director’s Discretionary Funds (DDRF)</b> 60,000+ USD awarded as seed funding for the project “Towards an Exoplanet Census in the Cloud” (PI: Espinoza).	2020B — present
<b>TESS Cycle 3 Guest Investigator Program</b> 40,000 USD allocated to the project “Towards Constraints On Morning And Evening Terminators Of Distant Worlds With TESS” (PI: Espinoza).	2020B — present
As co-I (total: 500,000+ USD):	
<b>NASA ROSES “Nancy Grace Roman Space Telescope Research and Support Participation Opportunities”</b> 300,000+ USD awarded to co-I Espinoza to lead the Roman Transiting Exoplanet Atmospheric Characterization WG (PI: Quintana; Science PI: Wilson)	2023B — present
<b>JWST Cycle 3 General Observers (GO) Program</b> 40,000+ USD awarded to the project “TUNES: The Unintentional NIRISS Escape Survey” (PI: Vissapragada; GO 5916)	2024B — present
<b>JWST Cycle 2 General Observers (GO) Program</b> 41,000+ USD awarded to the project “Constraining the Oxidation State of the Super-Earth TOI-1685 b” (PI: Fisher; US Admin-PI: Espinoza; GO 4195)	2023B — present
<b>JWST Cycle 2 General Observers (GO) Program</b> 67,000+ USD awarded to the project “Problem Planets: Understanding the Formation of Giant Planets around Low Mass Stars” (PI: Jordán; US Admin-PI: Espinoza; GO 3731)	2023B — present
<b>JWST Cycle 2 General Observers (GO) Program</b> 31,000+ USD awarded to the project “Calibrating NIRISS order 3 for very bright time-series observations with JWST.” (PI: Hoeijmakers; US Admin-PI: Espinoza; GO 3279)	2023B — present

## JWST Cycle 1 General Observers (GO) Program

2021B — present

80,000+ USD awarded to the project “TOI-178: the best laboratory for testing planetary formation theories” (PI: Hooton; US Admin-PI: Espinoza; GO 2319)

## Software

Selected software under active development:

### **juliet — a versatile tool for transiting and non-transiting exoplanetary systems**

2019—present

Lead developer | [juliet.readthedocs.io](https://juliet.readthedocs.io)

### **ExoCTK — the Exoplanet Characterization ToolKit**

2020—present

Science lead | [exoctk.readthedocs.io](https://exoctk.readthedocs.io)

### **Transit Spectroscopy**

2021—present

Lead Developer | [github.com/nespinoza/transitspectroscopy](https://github.com/nespinoza/transitspectroscopy)

### **tepspec — a pipeline for multi-object transit spectroscopy**

2016—present

Lead developer | [github.com/nespinoza/tepspec](https://github.com/nespinoza/tepspec)

### **abeec — an Approximate Bayesian Computation sampler**

2021—present

Lead developer | [github.com/nespinoza/abeec](https://github.com/nespinoza/abeec)

### **limbdarkening — software to compute stellar limb-darkening from model stellar atmospheres**

2015—present

Lead developer | [github.com/nespinoza/limbdarkening](https://github.com/nespinoza/limbdarkening)

## Invited Talks & Panels

Colloquia & Conference plenaries/reviews:

Joint JHU/STScI Colloquium, Baltimore, USA.

02/2025

Colloquium at the Instituto de Astrofísica, Pontificia Universidad Católica de Chile, Santiago, Chile.

08/2024

MIT Astrophysics Colloquium (MKI), MIT, Boston, USA.

03/2024

Invited Review at Open Problems in the Astrophysics of Gas Giants Conference, Puerto Natales, Chile.

12/2023

Institute of Astrophysics Colloquium, Pontificia Universidad Católica de Chile, Santiago, Chile.

12/2022

Astrophysical and Planetary Sciences Colloquium, CU Boulder, Colorado, USA.

11/2022

Physics & Astronomy Colloquium, George Mason University, Virginia, USA.	11/2022
Physics and Astronomy Colloquium, Wayne State University, Michigan, USA (Virtual Colloquium).	10/2022
Ole Rømer Colloquium, Institute of Physics and Astronomy, Aarhus Universitet, Denmark (Virtual Colloquium).	03/2022
Atmospheres, Atmospheres! Do I look like I care about atmospheres? (Atmo 2021; Virtual Conference).	08/2021
Chesapeake Bay Area Exoplanet Meeting Invited Talk, Carnegie DTM, Washington DC, USA.	01/2020
Colloquium Talk, Instituto de Física, Facultad de Ciencias, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile.	05/2019
Königstuhl Colloquium, MPA, Heidelberg, Germany.	05/2018
Atmospheres of Disks and Planets Workshop Invited Talk, Ringberg Castle, Germany.	04/2017
XI Chilean Astronomical Society Annual Science Meeting, San Esteban, Chile.	01/2014
<b>Invited panels:</b>	
First EMAC Workshop on Open-Access Exoplanet Modeling & Analysis Tools: “Best Development Practices for Open-Access Resources” invited panelist	02/2023
Celebrating JWST’s first six months of exoplanet data: “JWST Instrument Performance” invited panelist	11/2022
Emerging Researchers in Exoplanet Science VII: “Careers outside academia” invited panelist	08/2022
<b>Seminars (selected, last 5 years):</b>	
Université de Montréal Astrophysics Seminar, Université de Montréal, Montréal, Canada.	02/2024
ExoVAST Virtual Astronomy Software Talk	11/2023
Astronomy Departmental Seminar, Stockholm University, Sweden.	09/2023
ExoGuide Virtual Talk	04/2023

Thirty Minute Talk, ESO-Chile, Santiago, Chile.	12/2022
Astronomy Seminar, University of Sao Paulo, Brazil (Virtual Seminar).	04/2022
Astronomy and Space Physics Seminar, Uppsala University, Sweden (Virtual Seminar).	10/2021
Talk/Tutorial on JWST Data Analysis at the JWST ERS Hackaton (Virtual Workshop).	06/2021
Physics & Astronomy Seminar, Universidad Adolfo Ibáñez, Santiago, Chile (Virtual Seminar).	04/2020
Carnegie DTM Astro Seminar, Carnegie DTM, Washington DC, USA.	01/2020

## Service (selected; last 5 years)

Member of the “Transits to Trends” conference SOC	2024—present
Appointed Member of AURA’s Equity and Inclusion Council	2023—2025
Chair of the STScI/JHU ExoJamboree SOC	2024
Member of the “Know Thy Star 2” conference SOC	2023—2025
Member of STScI’s Exoplanet Strategic Initiatives Working Group	2023—2024
Member of the “Open Problems in the Astrophysics of Gas Giants” conference SOC	2023
Member of the AAS Weber Prize Committee	2023—present
Co-Organizer & Lecturer of the ExoLatam 2022 Workshop on JWST & exoplanet transit spectroscopy	2022
ExoGuide for NASA’s ExoPAG ExoExplorers Science Series	2022—2023A
Member of the “Towards Other Earths III: The Planet-Star connection” Conference SOC.	2022—2023
Member of the “Planetary Systems and the Origins of Life in the Era of JWST” STScI Spring Symposium Workshop Organizing Committee.	2022—2023
Member of the “Towards the Comprehensive Characterization of Exoplanets” STScI Spring Symposium SOC.	2020—2021
Co-chair of NASA’s ExoPAG Study Analysis Group 21.	2019—2022
Reviewer for Nature, Nature Astronomy, The Journal of Open Source Software, Astronomy & Astrophysics, The Astrophysical Journal, The Astronomical Journal, Astronomy & Computing Journal, Publications of the Astronomical Society of the Pacific Journal	2018—present

Reviewer for NSF AAG AST Grants

Reviewer for NASA's XRP Grants

Reviewer for the European Research Council Advanced Grants

Reviewer for the Chilean National Fund for Scientific and Technological Development (FONDECYT)

Reviewer for the Argentinian Commission of Physical Sciences

Co-Chair of STScI's Science Recruiting Committee

Chair, TESS TAC

Member of NASA's FINESST fellowship selection panel

Member of STScI's fellowship selection committee

Member of CSH's fellowship selection committee

## Outreach (Selected talks, initiatives & events; last 5 years)

Featured in "Universo Curioso de la NASA" – NASA in Spanish podcast	10/2024
Featured in various National TV interviews (Live Shots) for NASA's JWST anniversary	06/2024
Featured in IMAX's "Deep Sky"	10/2023
Public Lecture: "Finding Life in the Universe: where are we — and where are we going?", STScI, Baltimore, USA	10/2023
Interview for "On the Record" hosted by Sheilah Kast in WYPR 88.1 FM <a href="#">[link]</a>	09/2023
Public Lecture: "Our Place in the Universe: New Directions in Exploring and Understanding Exoplanets", Kozmetsky Center for Excellence, Texas, USA	03/2023
Public Lecture: "A New Eye in the Sky: exploring alien worlds with the James Webb Space Telescope", STScI, Baltimore, USA	03/2023
Featured in PBS NOVA's "New Eye on the Universe" <a href="#">[link]</a>	02/2023
Public Lecture: "Explorando Nuevos Mundos con el Telescopio Espacial James Webb", Santiago, Chile	12/2022
Featured in PBS NOVA's "Ultimate Space Telescope" <a href="#">[link]</a>	07/2022
Weekly astronomy show on Chilean national radio station "Radio USACH" / Podcast "Razones Siderales" <a href="#">[link]</a>	2020-2022
Universidad Nacional Autonoma de Mexico (UNAM)'s Public Keynote Lecture for the "Noche de Las Estrellas" (virtual) event <a href="#">[link]</a>	11/2021
Briefing for Astronomy Educators as part of NASA's Universe of Learning <a href="#">[link]</a>	8/2021

Public (virtual) lecture for the Universidad Católica del Maule, Chile <a href="#">[link]</a>	6/2021
Public (virtual) lecture for the Sociedad de Astronomía del Caribe <a href="#">[link]</a>	2/2021
Public (virtual) lecture for the Instituto de Astronomía of the Universidad Católica del Norte, Chile <a href="#">[link]</a>	12/2020
Public lecture as part of STScI's Youth for Astronomy & Engineering Program, STScI, Baltimore, USA	10/2020
Public Lecture as part of the STScI "Public Lecture Series", STScI, Baltimore, USA <a href="#">[link]</a>	03/2020

## Teaching

<b>Invited Lecturer, Department of Physics &amp; Astronomy, Johns Hopkins University</b> Course: "Planets, Life, and the Universe" (two lectures per semester)	2021B, 2022B, 2023B, 2024B
<b>Teacher, ProCredit Academy, Fürth, Germany</b> Course: "The Universe Around Us" (35 hours per course, 4 courses)	2019A
<b>Invited Lecturer, Faculty of Economics and Business, U. de Chile, Santiago, Chile</b> Course: "Introduction to Science" (one lecture per semester)	2016A, 2016B, 2017A, 2020A

## Postdoc Supervision & Mentoring

<b>Dr. Måns Holmberg (co-supervisor)</b> Space Telescope Science Institute	2024 — present
<b>Dr. Amelie Gressier (co-supervisor)</b> Space Telescope Science Institute	2023 — present
<b>Dr. Achrène Dyrek (postdoc mentor)</b> Space Telescope Science Institute	2025 — present

## Student Supervision & Mentoring

<b>Natalie Allen (PhD co-advisor)</b> Project: "Constraining Stellar Contamination in Space Based Transit Spectroscopy"   Institution: Johns Hopkins University.	2020B — present
<b>Yiwei Chai (PhD advisor)</b> Project: "Exoplanet atmospheres with the Roman Space Telescope"   Institution: Johns Hopkins University.	2022B — present
<b>Zoe Ko (PhD advisor)</b> Project: "Data-driven exploration of Exoplanet Atmospheric Retrievals to beat Stellar Contamination "   Institution: Johns Hopkins University.	2024B — present



<b>Gavin Wang (PURA research advisor; Undergraduate Student)</b> Project: “Likelihood-based methods for 1/f detector noise”   Institution: Johns Hopkins University.	2020B—present
<b>Natalia Oliveros Gomez (Mentor; PhD Student)</b> Institution: Johns Hopkins University.	2024—present
<b>Ceiligh Cacho-Negrete (Mentor; Undergraduate Student)</b> Project: “A population study of exoplanet atmospheres with JWST”   Institution: STScI (STScI SASP Summer Program).	2024B
<b>Patrick McCreery (First Year PhD student supervisor)</b> Project: “Improving transit spectroscopy simulations for JWST”   Institution: Johns Hopkins University.	2022B — 2023
<b>Derod Deal (Mentor; Undergraduate Student)</b> Project: “A quick-look pipeline for the JWST NIRISS/FGS”   Institution: STScI/University of Florida (STScI SASP Summer Program).	2023B
<b>Kevin Ortiz-Ceballos (Mentor; Undergraduate Student)</b> Project: “Improving the precision of exoplanet atmospheric detections through pixel-level decorrelation”   Institution: STScI/University of Puerto Rico Río Piedras (STScI SASP Summer Program).	2020B
<b>Kathryn Jones (Mentor; Master Student)</b> Project: “Extracting (transit) depths from morning and evening terminators in transit lightcurves”   Institution: MPIA, Germany/Oxford, United Kingdom (Summer Program).	2019B
<b>Diana Kossakowski (Mentor; PhD Student)</b> Project: “Gaussian Processes applied to transit lightcurves and radial velocities”   Institution: MPIA, Germany.	2018 — 2019
<b>Emily Sandford (Mentor; PhD Student)</b> Project: “Gaia & Singly Transiting Exoplanets”   Institution: PGIF Columbia/PUC Exchange Program, USA/Chile.	2018 — 2019
<b>Jayshil Patel (Master Thesis Advisor)</b> Thesis title: “Study of the limb darkening effect using exoplanet transit light curves from TESS data”   Institution: S V National Institute of Technology, India.	2019A
<b>Jennifer Fienco (Undergraduate Thesis Co-Advisor)</b> Thesis title: “Analitical Chemical Equilibrium for Exoplanetary Atmospheres”   Institution: Pontificia Universidad Católica de Chile, Chile.	2019A
<b>Roy Van der Westhuizen (Undergraduate Thesis Co-Advisor)</b> Thesis title: “Virtual exoplanet laboratory: APlastro”   Institution: Pontificia Universidad Católica de Chile, Chile.	2015B