

Dr. Enrique Paillas

Department of Astronomy & Steward Observatory
University of Arizona
933 N Cherry Ave, Tucson, AZ 85719, USA

ORCID 0000-0002-4637-2868
epaillas@arizona.edu
[epaillas.github.io](https://github.com/epaillas)

Academic Positions

University of Arizona Postdoctoral Associate Steward Observatory Prize Fellow	2024 — present
University of Waterloo WCA Postdoctoral Fellow	2021 — 2024

Education

Pontificia Universidad Católica de Chile (PUC) Ph. D. in Astrophysics (<i>summa cum laude</i>) Advisor: Dr. Nelson Padilla	2017 — 2021
Pontificia Universidad Católica de Chile (PUC) M. Sc. in Astrophysics (<i>summa cum laude</i>) Advisor: Dr. Nelson Padilla	2015 — 2017
Universidad Nacional Andrés Bello (UNAB) Licenciate in Astronomy (<i>cum laude</i>)	2010 — 2014

Fellowships & Awards

Prize Fellowship in Cosmological Data Analysis Research Fellowship awarded by the Steward Observatory at the University of Arizona.	2024
WCA Postdoctoral Fellowship Research Fellowship at the Waterloo Centre for Astrophysics, University of Waterloo.	2024
Excellence in Doctoral Thesis Award Yearly award granted by the Research Vice-Rectorate at PUC.	2021
ANID Graduate Research Fellowship Fellowship awarded by the Chilean Ministry of Education.	2017
Adelina Gutiérrez Travel Grant Research stipend awarded by the Chilean Astronomical Society.	2017

Leadership roles

Co-chair of the DESI Galaxy & Quasar Clustering Working Group

2024 - present

The galaxy/quasar clustering measurements are a key science product of the DESI project, leading to precision measurements of distances, growth, neutrino masses, and initial conditions. The GQC Working Group is charged to ensure that the DESI data products realize these goals.

Co-chair of the DESI Alternative Clustering Methods Topical Group

2022 - 2024

A Topical Group within GQC, developing pipelines and analysis tools for all alternative clustering methods which are not part of the current key projects but which can add cosmological information and may be considered for inclusion in future key projects.

Co-lead of the Optimal Reconstruction task force for DESI Key Project 4

2022 - 2024

Task Force that focused on calibrating the pipeline that DESI used to optimally extract the baryon acoustic oscillation signal from the galaxy and quasar samples, by using the technique of density-field reconstruction.

Grants

ComputeCanada Resources for Research Groups 2022 competition

2022A – present

1,349 core years on the narval-compute system awarded to “Cosmology from galaxy surveys” (PI: Percival; ID 4030)

Student Supervision & Mentoring

Tristan Fraser (Mentor; PhD student)

2021B—present

Project: “Alcock-Paczynski and RSD constraints from the void-galaxy cross-correlation in DESI Y1 data” | Institution: Waterloo Centre for Astrophysics, University of Waterloo.

James Morawetz (Mentor; Msc student)

2022B—present

Project: “Constraining primordial non-Gaussianity with density-split clustering” | Institution: Waterloo Centre for Astrophysics, University of Waterloo.

Service

Reviewer for Physical Review Letters / Physical Review D

2024—present

Reviewer for Monthly Notices of the Royal Astronomical Society

2023—present

Reviewer for Astronomy & Astrophysics

2022—present

Teaching

Teaching Assistant, Introduction to Astronomy (PUC)	2018A
Teaching Assistant, Differential Calculus (UNAB)	2014A
Teaching Assistant, Differential Equations (UNAB)	2013A
Teaching Assistant, Introduction to Mathematics (UNAB)	2012—2013

Publication List

First and Second Author

13. Liu, **Paillas** et al.: *Cosmological constraints from the Minkowski functionals of the BOSS CMASS galaxy sample*, submitted to JCAP (2024), arXiv:2501.01698
12. Morawetz, **Paillas** & Percival: *Constraining Primordial Non-Gaussianity with Density-Split Clustering*, JCAP (2025), 1, 26
11. Fraser, **Paillas**, Percival et al.: *Modelling the BOSS void-galaxy cross-correlation function using a neural network emulator*, submitted to JCAP (2024), arXiv:2407.03221
10. Burger, **Paillas** & Hudson.: *Cosmological parameters from the joint analysis of Density Split and Second Order Statistics: an Emulator based on the Halo Occupation Distribution*, Physical Review D (2024), 110, 8
9. **Paillas**, Ding, Chen et al.: *Optimal Reconstruction of Baryon Acoustic Oscillations for DESI 2024*, JCAP (2025), 1, 142
8. **Paillas**, Cuesta-Lazaro, Percival et al.: *Cosmological constraints from density-split clustering in the BOSS CMASS galaxy sample*, Monthly Notices of the Royal Astronomical Society (2024), 531, 898
7. Cuesta-Lazaro, **Paillas**, Yuan et al.: *SUNBIRD: A simulation-based model for full-shape density-split clustering*, Monthly Notices of the Royal Astronomical Society (2024), 531, 3336
6. **Paillas**, Cuesta-Lazaro, Zarrouk et al.: *Constraining $\nu\Lambda$ CDM through density-split clustering*, Monthly Notices of the Royal Astronomical Society (2023), 522, 606P
5. **Paillas**, Cai, Padilla & Sánchez: *Redshift-space distortions with split densities*, Monthly Notices of the Royal Astronomical Society (2021), 505, 5731
4. Davies, **Paillas**, Cautun & Li: *Optimal void finders in weak lensing maps*, Monthly Notices of the Royal Astronomical Society (2020), 500, 2417
3. **Paillas**, Cautun, Li et al.: *The Santiago-Harvard-Edinburgh-Durham void comparison II: unveiling the Vainshtein screening using weak lensing*, Monthly Notices of the Royal Astronomical Society (2020), 484, 1149

2. Cautun, **Paillas**, Cai et al.: *The Santiago-Harvard-Edinburgh-Durham void comparison I: SHEDding light on chameleon gravity tests*, Monthly Notices of the Royal Astronomical Society (2020), 476, 3195
1. **Paillas**, Lagos, Padilla et al.: *Baryon effects on void statistics in the EAGLE simulation*, Monthly Notices of the Royal Astronomical Society (2017), 470, 4434

Co-authored publications

27. Pinon et al. (including **Paillas**): *A theoretical approach to density-split clustering*, Submitted to JCAP, arXiv:2501.14638
26. Rosado-Mariín et al. (including **Paillas**): *Mitigating Imaging Systematics for DESI 2024 Emission Line Galaxies and Beyond*, Submitted to JCAP, arXiv:2411.12024
25. DESI Collaboration (including **Paillas**): *DESI 2024 VII: Cosmological Constraints from the Full-Shape Modeling of Clustering Measurements*, Submitted to JCAP, arXiv:2411.12022
24. DESI Collaboration (including **Paillas**): *DESI 2024 V: Full-Shape Galaxy Clustering from Galaxies and Quasars*, Submitted to JCAP, arXiv:2411.12021
23. DESI Collaboration (including **Paillas**): *DESI 2024 II: Sample Definitions, Characteristics, and Two-point Clustering Statistics*, Submitted to JCAP, arXiv:2411.12020
22. Chen, Ding, **Paillas** et al.: *Extensive analysis of reconstruction algorithms for DESI 2024 baryon acoustic oscillations*, Submitted to JCAP, arXiv:2411.19738
21. Davies et al. (including **Paillas**): *Constraining modified gravity with weak lensing peaks*, Monthly Notices of the Royal Astronomical Society (2024), 533, 3546
20. Perez-Fernández et al. (including **Paillas**): *Fiducial-Cosmology-dependent systematics for the DESI 2024 BAO Analysis*, JCAP (2025), 1, 144
19. Chen, Howlett et al. (including **Paillas**): *Baryon Acoustic Oscillation Theory and Modelling Systematics for the DESI 2024 results*, MNRAS (2024), 534, 1
18. DESI Collaboration (including **Paillas**): *DESI 2024 III: Baryon Acoustic Oscillations from Galaxies and Quasars*, submitted to JCAP (2024)
17. DESI Collaboration (including **Paillas**): *DESI 2024 IV: Baryon Acoustic Oscillations from the Lyman Alpha Forest*, JCAP (2025), 1, 124
16. DESI Collaboration (including **Paillas**): *DESI 2024 VI: Cosmological Constraints from the Measurements of Baryon Acoustic Oscillations*, JCAP (2025), 2, 21
15. Rashkovetskyi et al. (including **Paillas**): *Semi-analytical covariance matrices for two-point correlation function for DESI 2024 data*, JCAP (2025), 1, 145
14. Mena-Fernández et al. (including **Paillas**): *HOD-Dependent Systematics for Luminous Red Galaxies in the DESI 2024 BAO Analysis*, JCAP (2025), 1, 133
13. Garcia-Quintero et al. (including **Paillas**): *HOD-Dependent Systematics in Emission Line Galaxies for the DESI 2024 BAO analysis*, JCAP (2025), 1, 132
12. Ding et al. (including **Paillas**): *Suppressing the sample variance of DESI-like galaxy clustering with fast simulations*, JCAP (2025), 1, 143

11. Beyond-2pt Collaboration (including **Paillas**): *A Parameter-Masked Mock Data Challenge for Beyond-Two-Point Galaxy Clustering Statistics*, accepted in ApJ (2024), arXiv:2405.02252
10. DESI Collaboration (including **Paillas**): *Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument*, The Astronomical Journal (2024), 167, 62
9. DESI Collaboration (including **Paillas**): *The Early Data Release of the Dark Energy Spectroscopic Instrument*, The Astronomical Journal (2024), 168, 58
8. Radinovic et al. (including **Paillas**): *Alcock–Paczynski effect on void-finding: Implications for void-galaxy cross-correlation modelling*, Astronomy & Astrophysics, 691, A39
7. Woodfinden et al. (including **Paillas**): *Cosmological measurements from void-galaxy and galaxy-galaxy clustering in the Sloan Digital Sky Survey*, Monthly Notices of the Royal Astronomical Society (2023), 523, 6360W
6. Radinovic et al. (including **Paillas**): *Euclid: Cosmology forecasts from the void-galaxy cross-correlation function with reconstruction*, Astronomy & Astrophysics (2023), 677, 78
5. Kulier et al. (including **Paillas**): *The evolution of the baryon fraction in haloes as a cause of scatter in the galaxy stellar mass in the EAGLE simulation*, Monthly Notices of the Royal Astronomical Society (2019), 482, 3261K
4. Mao et al. (including **Paillas**): *DESCQA: An Automated Validation Framework for Synthetic Sky Catalogs*, The Astrophysical Journal (2018), 234, 36
3. Takáts et al. (including **Paillas**): *SN 2009ib: A Type II-P Supernova with an Unusually Long Plateau*, Monthly Notices of the Royal Astronomical Society (2015), 450, 3137
2. Bufano et al. (including **Paillas**): *SN2011hs: a Fast and Faint Type IIb Supernova from a Supergiant Progenitor*, Monthly Notices of the Royal Astronomical Society (2014), 439, 1807
1. Takáts. (including **Paillas**): *SN 2009N: Linking normal and subluminous type II-P Sne*, Monthly Notices of the Royal Astronomical Society (2014), 438, 368

Invited Talks

DESI Science Talk, APS Global Physics Summit, CA, USA	03/2025
Science Talk, Mock Barcelona Workshop, Spain	10/2024
Luncheon Talk, Center for Astrophysics Harvard & Smithsonian, MA, USA	11/2023
Seminar talk, Berkeley Center for Cosmological Physics, Berkeley, CA	01/2023
Science Talk, Euclid Consortium, Voids WP Telecon	03/2022
Seminar Talk, Waterloo Centre for Astrophysics, University of Waterloo, Waterloo, ON, Canada	01/2022

Mock Innsbruck: the connection between galaxies and dark matter haloes, Innsbruck, Austria	04/2020
Seminar Talk, University Observatory, Ludwig-Maximilians-Universität München, Munich, Germany	06/2019
Dynamics of the Large-scale Structure, Excellence Cluster 'Origins', MIAPP, Munich, Germany	06/2019
Seminar Talk, Max Planck Institute for Astronomy, Munich, Germany	06/2019
Mock Córdoba: galaxy formation for gravity and cosmology, Observatorio Astronómico de Córdoba, Córdoba, Argentina.	04/2019

Selected Contributed Talks

COSMO24, Kyoto, Japan.	10/2024
Canadian Astronomical Society Annual Meeting, Toronto, Canada.	06/2024
New Strategies For Extracting Cosmology From Future Galaxy Survey, Sexten, Italy	07/2023
DESI Collaboration Meeting, DoubleTree Berkeley Marina Hotel, San Francisco, CA, USA	06/2022
Friends-of-Friends meeting, virtual conference, hosted by Observatorio Astronómico de Córdoba	05/2021
The Cosmic Web: from galaxies to cosmology, Royal Observatory, Edinburgh, UK	05/2019
LSST DESC Collaboration Meeting, SLAC, San Francisco, CA, USA	03/2018

Outreach (Selected talks, events & positions)

Cosmology Talks @Youtube: "The Parameter Masked Mock Data Challenge for Beyond 2-Pt Statistics." [link]	May 2024
Talk at the Kitchener Public Library: "Unveiling the nature of dark energy with DESI."	May 2024
Newspaper Article in BioBio (w/ Bernardita Ried): "La energía oscura y la posibilidad de que los chilenos resolvamos sus misterios." [link]	April 2024
Newspaper Article in El Mostrador (w/ Bernardita Ried & Francisca Chabour): "Observatorios de Chile serán los mayores laboratorios de Física de Partículas." [link]	January 2024

Public talk at Astronomy on Tap in Kitchener/Waterloo: “A quest for dark energy: mapping the Universe on the largest scales.”

August 2023

Author at “Astrobitos”, the spanish-speaking version of the astro-ph reader’s digest “Astrobites” [[link](#)]

2016 – 2017

References

Will J. Percival

Mike and Ophelia Lazaridis chair in Astrophysics
Director Waterloo Centre for Astrophysics
University of Waterloo
001-519-888-4567, ext. 33108
will.percival@uwaterloo.ca

Nelson D. Padilla

Director Instituto de Astronomía Teórica y Experimental
CONICET / Universidad Nacional de Córdoba
nelson.padilla@unc.edu.ar

Ariel G. Sánchez

Research Scientist
Max Planck Institute for Extraterrestrial Physics
+49 (0)89 30000-3776
arielsan@mpe.mpg.de