Roohi Dalal

Graduate Student at Princeton University, Department of Astrophysical Sciences
4 Ivy Lane, Princeton, NJ, 08544
(602) 432-2971 | rdalal@princeton.edu

Education

Princeton University

M.A., Astrophysical Sciences — *2021*

Ph.D., Astrophysical Sciences, Certificate in Science, Technology and Environmental Policy — *2023 (expected)*

California Institute of Technology

B.S., Astrophysics and History (GPA 4.0/4.0) — *2018*

Research Interests

I work on research in both science policy and cosmology. In the case of the former, I am interested in space policy, and have undertaken research related to the impacts of satellite constellations on ground-based astronomical observations, the dangers of space debris, and legal mechanisms to promote the sustainable use of outer space. I plan to pursue a career in space policy after completing my PhD. I also study cosmology using data from large surveys of galaxies, particularly the Hyper Suprime-Cam (HSC) Subaru Strategic Program. I work on measuring cosmic shear and carrying out subsequent cosmological analyses, including improving our understanding and modeling of various systematic effects that can contaminate this measurement. I am currently leading analyses of cosmic shear and galaxy clustering for the HSC Year 3 data release.

Publications

- **Dalal, R.**, et al., *Cosmology from Cosmic Shear Power Spectra with Hyper Suprime-Cam Y3 Data*, (in prep)
- Zhang, T., Li, X., **Dalal, R.**, et al., *A General Framework for Removing Point Spread Function Systematics in Cosmological Weak Lensing Analysis*, (2022) arXiv:2212.03257 (submitted to MNRAS)
- Rau, M. M., **Dalal, R.**, Zhang, T., Li, X., et al., *Weak Lensing Tomographic Redshift Distribution Inference for the Hyper Suprime-Cam Subaru Strategic Program three-year shape catalogue* (2022) arXiv:2211.16516 (submitted to MNRAS)
- Martinelli, M., **Dalal, R.**, Majidi, F., Akrami, Y., et al., *Ultralarge-scale approximations and galaxy clustering: Debiasing constraints on cosmological parameters*, MNRAS 510 (2022) 1964
- **Dalal, R.**, Strauss, M. A., Sunayama, T., Oguri, M., et al., *Brightest cluster galaxies are statistically special from $z = 0.3$ to $z = 1$*, MNRAS 507 (2021) 4016

Honors and Awards

2022	**Best of Access, Diversity, and Inclusion Award (Princeton): Outstanding Programming** for work done as President of the Princeton Women in STEM Leadership Council
2018-23	**NSF Graduate Research Fellowship**
2018-19	**Fulbright Research Award**, Leiden University
2018	**Mabel Beckman Prize (Caltech)**, for academic and personal excellence, outstanding character and leadership.
2018	**Eleanor Searle Prize in Law, Politics and Institutions (Caltech)**, for senior thesis in History.
2018	**Gates Cambridge Scholarship** (declined)
2017	**Deans' Cup (Caltech)**, for persistent efforts to improve the quality of undergraduate life.
2016-18	**Mellon Mays Undergraduate Fellowship (Caltech)**
2014-15	**Milton and Jane Mohr Scholarship (Caltech)**

Invited Talks

Nov 2022	**"Cosmology from Cosmic Shear Power Spectra with HSC Y3"** Tuscon Astrophysics and Cosmology Seminar, University of Arizona
Oct 2022	**"Space Debris and Nuclear Strategic Stability"** Princeton School on Science and Global Security
Feb 2022	**"Brightest Cluster Galaxies are Statistically Special from $z = 0.3$ to $z = 1$"** Galread, Princeton University
Nov 2021	**"Brightest Cluster Galaxies are Statistically Special from $z = 0.3$ to $z = 1$"** OPINAS Seminar, Max Planck Institute for Extraterrestrial Physics and Universitäts-Sternwarte München
May 2019	**"Debiasing Ultra-Large Scale Cosmology"** de Sitter Seminar, Leiden University

Successful Observing Proposals

S23A	**Baade Telescope, Las Campanas Observatory** 1 night
S22B	**Gemini South** 26.4 hr
S22A	**Clay Telescope, Las Campanas Observatory** 1 night
S22A	**Gemini North and Gemini South** 45.7 hr

Teaching Experience

Fall 2021	**AST255 - Life in the Universe**, Assistant in Instruction	*Princeton*
Spring 2021	**AST204 - Topics in Modern Astronomy**, Assistant in Instruction	*Princeton*
Spring 2017, 2018	**Ay1 - The Evolving Universe**, Teaching Assistant	*Caltech*
Winter 2018	**Ph2b -Quantum Mechanics**, Teaching Assistant	*Caltech*

Advising Experience

Jupiter Ding	Undergraduate Summer Research Program and Junior Paper (2022)
Savannah Pobre	Undergraduate Summer Research Program and Junior Paper (2021)

Leadership, Outreach and Service

I am passionate about improving equity and inclusion in STEM, facilitating better communication between scientists and policy makers, and scientific outreach. A selected list of my involvements in such activities follows.

2013-	**USA Astronomy and Astrophysics Olympiad**, President (2013-18, 2019-20), Founding member, Board of Directors (2013-), Team leader (2014, 2016)	
2021-	**Women in STEM Leadership Council**, President (2021-22), Council member (2019-)	*Princeton*
2019-	**Women in Physics**, Executive board member	*Princeton*
2020-22	**Graduate Scholars Program**, Peer Mentor	*Princeton*
2019-22	**Astrophysics Climate Committee**, Graduate student representative	*Princeton*
2018-20	**Astronomy on Tap**, Organizer, Speaker	*Trenton, Leiden*
2020	**WFIRST Congressional Advocacy Day**, Participant	*Washington, DC*
2019	**Fulbright EU-NATO Seminar**, Representative from the Netherlands Fulbright Commission	*Luxembourg, Belgium*
2015-18	**Title IX**, Undergraduate advisory board chair, Co-founder of Title IX Advocate Program	*Caltech*
2017-18	**Women in Physics, Math and Astronomy**, Co-founder, Organizing committee member	*Caltech*
2018	**American Astronomical Society Congressional Visit Day**, Participant	*Washington, DC*
2017	**Astrophysics Option Committee**, Co-chair (evaluated and revised the astrophysics major)	*Caltech*
2017-18	**Conduct Review Committee**, Elected representative	*Caltech*
2015-18	**Hixon Writing Center**, Peer tutor	*Caltech*
2014-18	**Caltech Y RISE Program**, Tutor, Advisory board member	*Caltech*