Roohi Dalal

Deputy Director of Public Policy, American Astronomical Society

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Appointments

Deputy Director of Public Policy
American Astronomical Society — *Oct 2024-*

Research Collaborator
Princeton Program on Science and Global Security — *Jan 2025-*

Postdoctoral Fellow in Space Security and Sustainability
Outer Space Institute and University of British Columbia — *April-Oct 2024*

Fulbright Research Scholar
Leiden University — *2018-19*

Education

Princeton University
Ph.D., Astrophysical Sciences *(Advisor: Michael Strauss)* — *2024*
Certificate in Science, Technology and Environmental Policy *(Advisor: Christopher Chyba)* — *2024*
M.A., Astrophysical Sciences — *2021*

California Institute of Technology
B.S., Astrophysics and History (GPA 4.0/4.0) — *2018*

Research Interests

I am an astronomer working to advance humanity's relationship with the cosmos. As the Deputy Director of Public Policy at the American Astronomical Society, I advocate for legislation and regulation to support the astronomy community, including robust funding for the sciences, policies to support an inclusive workforce, and protection of the night sky from light pollution and radio frequency interference. Additionally, I am deeply involved in research on space sustainability and security, including security at the nuclear-space nexus. As an astronomer, I continue to be involved in studies of dark matter and dark energy using large surveys of galaxies.

Honors and Awards

2025 **Payload Pioneer** named one of 30 leaders in the space industry under 30 years old
2024 **NSF Astronomy and Astrophysics Postdoctoral Fellowship** *(declined)*
2024 **Brinson Prize Fellowship in Observational Cosmology** *(declined)*
2023 **Equity Award (Princeton Astrophysics)** for many positive contributions to the department climate, working towards a more inclusive environment.
2023 **Next-Generation Fellowship** Physicists Coalition for Nuclear Threat Reduction
2022 **Best of Access, Diversity, and Inclusion Award: Outstanding Programming (Princeton)** for work done as President of the Princeton Women in STEM Leadership Council.
2018-23 **NSF Graduate Research Fellowship**
2018-19 **Fulbright Research Award**
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.
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)**

Grants and Observing Time

2025- **Carnegie Endowment for International Peace** "Emerging Technologies and Nuclear Weapons Risks," (Participant)
2023-24 **LSST Discovery Alliance Inclusive Collaboration** "Code Tutorials to Enable Participation," $12,000 (PI)
2022-24 **Clay Telescope, Las Campanas Observatory** 3 nights (PI)
2023 **Baade Telescope, Las Campanas Observatory** 2 nights (PI)
2022-23 **Gemini North and Gemini South** 97 hours (PI)

Advising Experience

Teodor Grosu	Junior Paper (2025)
Jupiter Ding	Undergraduate Summer Research Program and Junior Paper (2022)
Savannah Pobre	Undergraduate Summer Research Program and Junior Paper (2021)

Teaching Experience

2023	**SPI353 - Science and Global Security**, Guest Lecturer	*Princeton*
2021	**AST255 - Life in the Universe**, Assistant in Instruction	*Princeton*
2021	**AST204 - Topics in Modern Astronomy**, Assistant in Instruction	*Princeton*
2017, 2018	**Ay1 - The Evolving Universe**, Teaching Assistant	*Caltech*
2018	**Ph2b -Quantum Mechanics**, Teaching Assistant	*Caltech*

Selected Talks

"The Sky We All Share: Space, Exploration, and Policies to Sustain the Human Connection"

May 2026	Keynote, World Technology Law Conference*

"Space Sustainability in the Era of Satellite Megaconstellations and Novel Space Activities"

Nov 2025	Global Security Technical Webinar Series*
Oct 2025	Princeton School on Science and Global Security*

"Space Debris and Nuclear Strategic Stability"

Sept 2024	Advanced Maui Optical and Space Surveillance Technologies Conference
April 2024	Space Security Panel, Western University*
April 2023	Liechtenstein Institute on Self-Determination, Princeton University*
Oct 2022	Princeton School on Science and Global Security

"National Security Interests in Relation to Dark and Quiet Skies"

Oct 2023	IAU385 Symposium on Astronomy and Satellite Constellations

"Cosmology from Cosmic Shear Power Spectra with Hyper Suprime-Cam Year 3 Data"

Sept 2023	UPenn Astro Seminar*
Aug 2023	UChicago/KICP Open Seminar*
Aug 2023	Rubin Observatory Project and Community Workshop
May 2023	Institute for Nuclear and Particle Astrophysics Seminar, Lawrence Berkeley National Laboratory*
May 2023	KIPAC Tea Talk, Stanford University*
May 2023	Cosmology Seminar, Duke University*
April 2023	Future Science with CMBxLSS Workshop, Kyoto University
April 2023	Astrophysics Seminar, Carnegie Mellon University*
Nov 2022	Tucson Astrophysics and Cosmology Seminar, University of Arizona*

"Brightest Cluster Galaxies are Statistically Special from $z = 0.3$ to $z = 1$"

Feb 2022	Galread, Princeton University*
Nov 2021	OPINAS Seminar, Max Planck Institute for Extraterrestrial Physics and Universitäts-Sternwarte München*

"Debiasing Ultra-Large Scale Cosmology"

May 2019	de Sitter Seminar, Leiden University

* = invited

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.

2023-	**AAS Committee for the Protection of Astronomy and the Space Environment**, Policy Vice-Chair (2024), Member (2023-)

2023-	**IAU Centre for the Protection of the Dark and Quiet Sky**, Policy Hub member	
2013-	**USA Astronomy and Astrophysics Olympiad**, President (2013-18, 2019-20), Founding member, Board of Directors (2013-), Team leader (2014, 2016)	
2025	**United Nations Institute for Disarmament Research Demonstrative Verification Workshop**, Invited Participant	*Geneva*
2022-24	**Princeton Astrophysics Survey Science Discussions**, Organizer	*Princeton*
2019-24	**Women in STEM Leadership Council**, President (2021-22), Council member (2019-24)	*Princeton*
2023	**Princeton School on Science and Global Security**, Organizer	*Princeton*
2023	**ASCEND Session Organizer**, Sustainable Use of Low Earth Orbit for Science and Society	*Las Vegas*
2023	**Princeton Citizen Scientists**, Congressional Visit Organizer	*Washington, DC*
2020-22	**Graduate Scholars Program**, Peer Mentor	*Princeton*
2019-22	**Women in Physics**, Executive board member	*Princeton*
2019-22	**Astrophysics Climate Committee**, Graduate student representative	*Princeton*
2019-22	**Astrophysics Graduate Student Committee**, Cohort Representative	*Princeton*
2020-21	**Committee on Equity in Astrophysics Graduate Admissions**, Graduate student representative	*Princeton*
2018-20	**Astronomy on Tap**, Organizer, Speaker	*Trenton, Leiden*
2020	**WFIRST Congressional Advocacy Day**, Participant	*Princeton*
2019	**Fulbright EU-NATO Seminar**, Representative from the Netherlands Fulbright Commission	*Luxembourg*
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*

Publications

Since the start of my PhD in September 2019, I have authored a total of 18 papers in peer-reviewed journals with a total of 2045 citations (h-index of 14).

Lead Author (* indicates work led by a student I advised):

- **Dalal, R.**, *Environmental Impacts Throughout a Satellite Megaconstellation Lifecycle* (Book Chapter in "Responsibility in Outer Space" Routledge, in press)
- **Dalal, R.**, Zhang, V. *Handle with Care: Nuclear Weapons and Nuclear Power Sources in Outer Space* (Outer Space Institute Report, 2026)
- **Dalal, R.**, *National Security Interests in Relation to Dark and Quiet Skies* (Proceedings of IAU Symposium 385, 2026)
- Zhang, V., **Dalal, R.** *New Proliferation Risks of HALEU for Space Applications* (NPT News in Review, 2025)
- *Gu, S., van Waerbeke, L., Bernardeau, F., **Dalal, R.**, *Mitigating nonlinear systematics in weak lensing surveys: The Bernardeau-Nishimichi-Taruya approach*, PRD 111, 083530 (2025)
- *Ding, J., **Dalal, R.**, et al. *Miscentering of Optical Galaxy Clusters Based on Sunyaev-Zeldovich Counterparts*, MNRAS 536, 572-591 (2024)
- **Dalal, R.**, Boley, A., Byers, M., *Space Debris and Nuclear Strategic Stability: Collision Risks and Attribution Potential in GEO*, AMOS Technical Paper (2024)
- **Dalal, R.**, Li, X., Nicola, A., Zuntz, J. et al., *Hyper Suprime-Cam Year 3 Results: Cosmology from Cosmic Shear Power Spectra*, PRD 108, 123519 (2023)
- Li, X., Zhang, T., Sugiyama, S., **Dalal, R.** et al., *Hyper Suprime-Cam Year 3 Results: Cosmology from Cosmic Shear Two-point Correlation Functions*, PRD 108, 123518 (2023)
- *Pobre, S., **Dalal, R.**, Strauss, M., Lin, Y-T., *Are Brightest Cluster Galaxies Special?*, RNAAS 7, 19 (2023)
- Zhang, T., Li, X., **Dalal, R.**, Mandelbaum, R. et al., *A General Framework for Removing Point Spread Function Systematics in Cosmological Weak Lensing Analysis*, MNRAS 525, 2441-2471 (2023)
- 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*, MNRAS 524, 5109-5131 (2023)

- Martinelli, M., **Dalal, R.**, Majidi, F., Akrami, Y. et al., *Ultralarge-scale approximations and galaxy clustering: Debiasing constraints on cosmological parameters*, MNRAS 510, 1964-1977 (2022)
- **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, 4016-4029 (2021)

Significant Contributions:

- Zhang, T., ..., **Dalal, R.** et al., *Cosmology and Source Redshift Constraints from Galaxy Clustering and Tomographic Weak Lensing with HSC Y3 and SDSS using the Point-Mass Correction Model*, PRD 113, 103530 (2026).
- Zhang, T., ..., **Dalal, R.** et al., *Modeling Galaxy Clustering and Tomographic Galaxy-Galaxy Lensing with HSC Y3 and SDSS using the Point-Mass Correction Model and Redshift Self-Calibration*, PRD 113, 103529 (2026).
- Chen, T-C., ..., **Dalal, R.** et al., *A Systematic Search of Distant Superclusters with the Subaru Hyper Suprime-Cam Survey*, ApJ 975, 200 (2024)
- Sunayama, T., ..., **Dalal, R.** et al., *Optical Cluster Cosmology with SDSS redMaPPer clusters and HSC-Y3 lensing measurements*, PRD 110, 083511 (2024)
- Madhavacheril, M., ..., **Dalal, R.** et al., *The Atacama Cosmology Telescope: DR6 Gravitational Lensing Map and Cosmological Parameters*, ApJ 962, 113 (2024)
- Qu, F., ..., **Dalal, R.** et al., *The Atacama Cosmology Telescope: A Measurement of the DR6 CMB Lensing Power Spectrum and its Implications for Structure Growth*, ApJ 962, 112 (2024)
- Dark Energy Survey, Kilo-Degree Survey Collaboration, ..., **Dalal, R.** et al., *DES Y3 + KiDS-1000: Consistent cosmology combining cosmic shear surveys*, OJAP 6, 36 (2023)
- More, S., ..., **Dalal, R.** et al., *Hyper Suprime-Cam Year 3 Results: Measurements of Clustering of SDSS-BOSS Galaxies, Galaxy-Galaxy Lensing and Cosmic Shear*, PRD 108, 123520 (2023)
- Miyatake, H., ..., **Dalal, R.** et al., *Hyper Suprime-Cam Year 3 Results: Cosmology from Galaxy Clustering and Weak Lensing with HSC and SDSS using the Emulator Based Halo Model*, PRD 108, 123522 (2023)
- Sugiyama, S., ..., **Dalal, R.** et al., *Hyper Suprime-Cam Year 3 Results: Cosmology from Galaxy Clustering and Weak Lensing with HSC and SDSS using the Minimal Bias Model*, PRD 108, 123517 (2023)