Prakruth Adari

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Education

2021 - present Ph.D., Physics and Astronomy at **Stony Brook University**
2016 - 2020 B.A. in Physics and Math at **Columbia University**

Research Experience

LSST Dark Energy Science Collaboration (DESC)

Catalog based detection of unrecognized blends - Use of AI/ML tools to detect unrecognized blends at the catalog level. Proof of concept work that could be used to improve weak lensing. Paper listed below.

Unrecognized blends + Anacal Shear Calibration - Testing how removal of unrecognized blends can help improve shear calibration within the Anacal framework. On-going work expected to finish early 2026.

friendly - Leading *friendly* project to consolidate efforts on defining, detecting, and studying unrecognized blends for different science cases. On-going software work expected to finish late 2026.

Vera C. Rubin Observatory

Cluster commissioning - Stress testing Rubin pipelines by conducting cluster weak lensing science. Worked on source selection, Anacal shear measurements, and $N(z)$ estimates. Also created an independent photo-z validation set. Paper and technotes listed below.

DP1 Photo-z - Created an independent photo-z validation set with DESI cross matched spec-z to test and validate DP1 photo-z estimates. Paper and technote listed below.

Active Optics - Helped characterize active optics system by studying variation in measured and fit parameters between nights.

SENSEI

SENSEI backgrounds - Characterized backgrounds for SENSEI dark matter direct detection experiment. Optimized masks and binning parameters to maximize signal on Skipper CCDs. Papers listed below.

Honors and Awards

DOE SCGSR Fellowship ($10,800) — Department of Energy - 2025
Lourie Fellowship ($6,000) — Stony Brook University - 2024
Gerald Brown Prize ($1,000) — Stony Brook University - 2023
DOE SULI ($12,000) — Department of Energy - 2020
DOE SULI ($5,300) — Department of Energy - 2018

Publications

Major Author

Liang, Shuang et al. (Mar. 2025). "Catalog-based detection of unrecognized blends in deep optical ground based imaging". In: *Open J. Astrophys. (in review)*. arXiv: 2503.16680 [astro-ph.CO].

von der Linden, Anja et al. (2025, in prep.). *A Rubin view of Abell 360*.

Adari, Prakruth and Anja von der Linden (Jan. 2025a). *SITCOMTN-128: Unrecognized Blends in LSSTComCam Data Preview 1 ECDFS*. DOI: 10.71929/RUBIN/2570850.

Adari, Prakruth and Anja von der Linden (Jan. 2025b). *SITCOMTN-163: Source Selection for Abell 360 in LSSTComCam Data Preview 1*. DOI: 10.71929/RUBIN/2571157.

Adari, Prakruth and Anže Slosar (2024). "Searching for parity violation in SDSS DR16 Lyman-α forest data". In: *Phys. Rev. D* 110.10, p. 103534. DOI: 10.1103/PhysRevD.110.103534. arXiv: 2405.04660 [astro-ph.CO].

Adari, Prakruth and Anže Slosar (2022). "Generalized redundant calibration of radio interferometers". In: *Phys. Rev. D* 106.4, p. 043006. DOI: 10.1103/PhysRevD.106.043006. arXiv: 2107.10186 [astro-ph.IM].

Contributing Author

Zhang, T. et al. (Oct. 2025). "Photometric Redshift Estimation for Rubin Observatory Data Preview 1 with Redshift Assessment Infrastructure Layers (RAIL)". In: *arXiv e-prints*, arXiv:2510.07370, arXiv:2510.07370. DOI: 10.48550/arXiv.2510.07370. arXiv: 2510.07370 [astro-ph.IM].

Mendoza, Ismael et al. (2025). "The Blending ToolKit: A simulation framework for evaluation of galaxy detection and deblending". In: *Open J. Astrophys.* 8, p. 001c.129699. DOI: 10.33232/001c.129699. arXiv: 2409.06986 [astro-ph.IM].

Charles, Eric et al. (Jan. 2025). *SITCOMTN-154: Initial studies of photometric redshifts with LSSTComCam from DP1*. DOI: 10.71929/RUBIN/2571480.

NSF-DOE Vera C. Rubin Observatory Team et al. (Jan. 2025). *RTN-095: The Vera C. Rubin Observatory Data Preview 1*. DOI: 10.71929/RUBIN/2570536.

Adari, Prakruth et al. (2025). "First Direct-Detection Results on Sub-GeV Dark Matter Using the SENSEI Detector at SNOLAB". In: *Phys. Rev. Lett.* 134.1, p. 011804. DOI: 10.1103/PhysRevLett.134.011804. arXiv: 2312.13342 [astro-ph.CO].

Adari, Prakruth et al. (2023). "Charging up boosted black holes". In: *Phys. Rev. D* 107.4, p. 044055. DOI: 10.1103/PhysRevD.107.044055. arXiv: 2111.15027 [gr-qc].

Adari, P. et al. (Feb. 2022). "EXCESS workshop: Descriptions of rising low-energy spectra". In: *arXiv e-prints*, arXiv:2202.05097, arXiv:2202.05097. DOI: 10.48550/arXiv.2202.05097. arXiv: 2202.05097 [astro-ph.IM].

Talks and Posters

Invited Talks

Seminar, ASIAA	Taipei, Taiwan - 2025
Talk, Parity Violation from Home	Online - 2024
Seminar, DESI Lyman-α Working Group	Online - 2024

Contributed Talks

Plenary, DESC Collaboration Meeting	Urbana-Champaign, IL - 2025
Plenary, DESC Collaboration Meeting	Menlo Park, CA - 2023

Posters

DESC Collaboration Meeting	Urbana-Champaign, IL - 2025
Cosmology and galaxy astrophysics with simulations and machine learning	New York, NY - 2024
DESC Collaboration Meeting	Zürich, Switzerland - 2024
DESC Collaboration Meeting	Menlo Park, CA - 2023

Teaching Experience

Teaching Assistant

ASTRO 443: Observational Techniques in Astronomy	2023
PHY 134: Classical Physics Laboratory II	2023
PHY 121: Physics for the Life Sciences I	2022
IACS Python Summer Bootcamp	2021

Mentoring

Gunjan Deshpande

Graduate student in Data Science at Stony Brook. Worked on investigating possible improvements to catalog-based detection of unrecognized blends by including AGNs and testing Random Forest variants (XGBoost, Extremely Randomized Forests).

Institutional Service

Quality of Life Analysis

Ran a "Quality of Life" survey to assess students mental and physical wellbeing along with collecting views on the department. Helped design, disseminate, and analyze survey. Culminated into a presentation for the faculty and chair of the department leading to various improvements including pay and increased academic support for incoming students.

PGSA Treasurer

Served as Physics Graduate Student Association (PGSA) treasurer from 2023-2025. Helped schedule and run tea time, organize and procure materials for social events, and schedule practice talks during the semester.