KATHERINE LALIOTIS

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EDUCATION

The Ohio State University — Columbus, OH
Master's of Science (MS), Physics; Adviser: Christopher M. Hirata — December 2023
Doctorate of Philosophy (PhD), Physics; Adviser: Christopher M. Hirata — *Expected 2026*
Honors: Honorable Mention from NSF Graduate Research Fellowships Program, Dept. of Energy Office of Science Graduate Student Research (SCGSR) Fellowship Awardee

Whitman College — Walla Walla, WA
Bachelor of Arts in Physics & Astronomy, Minor in Mathematics — May 2021
Honors: Magna Cum Laude, Honors in Major, Walter A. Brattain Scholarship

RESEARCH EXPERIENCE

Kavli Institute for Particle Astrophysics and Cosmology, SLAC — November 2024 - Present
DOE SCGSR Fellow

- Analyzed observations from the LSST Commissioning Camera and LSST Camera to diagnose systematic errors in the point-spread function (PSF) fitting and modeling in the LSST Pipeline
- Modifying and upgrading PSF modeling technique for LSST Camera image processing to improve performance for the LSST Weak Lensing Survey
- Creating framework for data-sharing between LSST/Rubin and Roman telescopes in collaboration with both teams (ongoing)

Dept. of Physics, the Ohio State University — August 2022 - Present
Graduate Research Assistant

- Analyzed noise data from *Roman* detectors to understand the exact impact of noise on weak lensing measurement precision
- Developing a Python program for removal of correlated noise from *Roman* images in order to improve weak lensing, in alignment with the findings from the above work (ongoing)
- Modified and expanded a C++ program testing different potential observing strategies for the Nancy Grace Roman Space Telescope (*Roman*) mission, and constructed a sample observing plan for the High Latitude Survey for use in the *OpenUniverse* simulations
- Contributed ideas and communicated findings in regular meetings with advisor and collaborators
- Collaborated on 4 papers describing the *Roman* image processing simulations, their results, and the implications for *Roman* science

Exoplanet Exploration Program, Jet Propulsion Laboratory — June 2020 - August 2020
Intern

- Compiled sets of archival radial velocity (RV) data from 13 instruments for 54 target stars for future exoplanet direct imaging missions.
- Analyzed RV data using multiple Python packages to find evidence of stellar/sub-stellar companions or activity cycles
- Wrote, edited, and published a research manuscript on this work as primary author

LEADERSHIP & OUTREACH

Polaris Program, the Ohio State University — April 2022 - Present
Parliamentarian

- Planned and facilitated weekly meetings of the 12-person Polaris organization Leadership Team of grads and undergrads across different subfields of physics and astronomy
- Created and documented new Recruitment & Marketing, Grants, and High School Outreach committees

· Presented a twice-yearly report to community stakeholders detailing the use of our $60,000 budget, the successes of our outreach programs, and ideal areas of prospective growth

***URSA* Polaris Program, the Ohio State University**
Program Facilitator *Summer 2024, Summer 2022*

· Marketed URSA to over 50 incoming physics/astronomy students from underrepresented backgrounds via mail, email, phone, and social media
· Organized logistics of the 15-student program, including housing, meals, transportation, technology access, classroom spaces, and communication channels between facilitators and participants
· Designed and taught a 2-week engaging, group-work centered curriculum exploring the question *"What is Time?"* through the lens of astrophysics

TEACHING EXPERIENCE

Dept. of Physics, the Ohio State University August 2022 - May 2023
Graduate Teaching Associate

· Courses: "Mechanics, Work and Energy, Thermal Physics" and "E&M, Waves, Optics, Modern Physics"
· Delivered supplementary lectures, guided student group work sessions, and facilitated labs weekly
· Developed engaging and educational problems and materials for weekly office hours and 3 exam review sessions; gathered and used student feedback to inform teaching strategies and focuses

SCIENTIFIC PUBLICATIONS

Laliotis, Katherine, et al. "Analysis of Biasing from Noise from the Nancy Grace Roman Space Telescope: Implications for Weak Lensing." Publications of the Astronomical Society of the Pacific, vol. 136, no. 12, 1 Dec. 2024, p. 124506, https://doi.org/10.1088/1538-3873/ad9bec. Accessed 19 Feb. 2025.

OpenUniverse, et al. "OpenUniverse2024: A Shared, Simulated View of the Sky for the next Generation of Cosmological Surveys." ArXiv.org, 2024, arxiv.org/abs/2501.05632. Accessed 19 Feb. 2025.

Cao, Kaili, Hirata, Christopher M., **Laliotis, Katherine**, et al. "Simulating Image Coaddition with the Nancy Grace Roman Space Telescope: III. Software Improvements and New Linear Algebra Strategies." ArXiv.org, 2024, arxiv.org/abs/2410.05442. Accessed 19 Feb. 2025.

Masaya Yamamoto, **Katherine Laliotis**, Emily Macbeth, Tianqing Zhang, Christopher M Hirata, M A Troxel, et al., Simulating image coaddition with the Nancy Grace Roman Space Telescope – II. Analysis of the simulated images and implications for weak lensing, Monthly Notices of the Royal Astronomical Society, Volume 528, Issue 4, March 2024, Pages 6680–6705, https://doi.org/10.1093/mnras/stae177

Christopher M Hirata, Masaya Yamamoto, **Katherine Laliotis**, Emily Macbeth, M A Troxel, Tianqing Zhang, Kaili Cao, et al., Simulating image coaddition with the Nancy Grace Roman Space Telescope – I. Simulation methodology and general results, Monthly Notices of the Royal Astronomical Society, Volume 528, Issue 2, February 2024, Pages 2533–2561, https://doi.org/10.1093/mnras/stae182

Laliotis, Katherine, Burt, J. A., Mamajek, E. E., Li, Z., Perdelwitz, V., et al. (2023). Doppler constraints on planetary companions to nearby sun-like stars: An archival radial velocity survey of southern targets for proposed NASA Direct Imaging Missions. The Astronomical Journal, 165(4), 176. https://doi.org/10.3847/1538-3881/acc067

PUBLIC WRITING

Laliotis, Katherine Helen. "Europe's Extremely Large Telescope Faces a New Dire Threat." Scientific American, 30 Jan. 2025, www.scientificamerican.com/article/europes-extremely-large-telescope-faces-a-new-dire-threat/. Accessed 19 Feb. 2025.

Laliotis, Katherine. "Saving the Chandra X-Ray Observatory." Undark Magazine, 19 Sept. 2024, undark.org/2024/09/19/opinion-saving-chandra-x-ray-observatory/.