Lauryn E. Williams

Ph.D. Candidate — NSF Fellow
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Education

University of Washington – Seattle **Sep. 2022 – Present**
Doctor of Philosophy – Astronomy *Seattle, WA*
Master of Science – Astronomy *Sep. 2022 – June 2024*

University of Missouri – Columbia **Aug. 2018 – May 2022**
Bachelor of Science – Physics (emphasis in Astronomy) *Columbia, MO*
Bachelor of Science – Mathematics

Research Experience

Department of Astronomy, University of Washington – Seattle: **Sep. 2022 – Present**
Graduate Student
Seattle, WA

- Studying the formation and evolution of Thorne-Żytkow Objects (TŻOs).
- Utilizing a variety of computational techniques, including binary population synthesis, moving-mesh hydrodynamics, and stellar evolution codes to understand the formation and complex interiors of TŻOs.

Department of Physics and Astronomy, University of Missouri – Columbia: **Feb. 2019 – May 2022**
Undergraduate Research Assistant
Columbia, MO

- Studied the morphology of young galaxies from the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS).
- Comparing and analyzing the physical parameter spaces of a variety of galaxies.

American Museum of Natural History **Jun. 2021 – Aug. 2021**
Undergraduate Summer Researcher
(remote due to COVID-19)

- Calculated the dynamical masses of companions from accelerating stars in the Hipparcos-Gaia Catalog of Accelerations (HGCA).
- Compared radial velocity curves of accelerating stars to determine the possibility of stellar companions.

Boulder Solar Alliance, University of Colorado – Boulder: **May 2020 – Aug. 2020**
Undergraduate Summer Researcher
(remote due to COVID-19)

- Focused on the Mid-Wave Infrared (MWIR) spectroscopic observations of the solar corona from the 2017 total solar eclipse.
- Produced detailed imaging of solar prominences and other active regions from comparing two different sets of coronal spectroscopic data.

Publications

First Author

- **Lauryn E. Williams**, Philip Chang, Emily M. Levesque, Thomas R. Quinn *Neutron Star-Main Sequence Mergers Robustly Form Dynamically Stable Thorne-Żytkow Objects*, ApJ, 2025 ; DOI

Co - Author

- John Pharo, Yicheng Guo, Guillermo Barro Calvo, . . . , **Lauryn E. Williams**, Benjamin Winningham *The Dwarf Galaxy Population at $Z \sim 0.7$: A Catalog of Emission Lines and Redshifts from Deep Keck Observations*, ApJS, 2022 ; DOI

- Daniella C. Bardalez Gagliuffi, Jacqueline K. Faherty, Yiting Li, Timothy D. Brandt, **Lauryn E. Williams**, G. Mirek Brandt, Christopher Gelino *14 Her: A Likely Case of Planet-Planet Scattering*, ApJL, 2021 ; DOI

Presentations

Modeling the Formation of Thorne-Żytkow Objects: Hydrodynamical Simulations of Neutron Star-Main Sequence Mergers

- IAUS 402: Massive Stars Across Redshifts in the Era of JWST and Large-Scale Surveys | *Poster Presentation*, **Sep. 2025**
- AAS 246th Winter Meeting | *Oral Presentation*, **Jun. 2025**
- XXXII IAU General Assembly | *(virtual) Poster Presentation*, **Aug. 2024**

*Identifying Dynamical Masses Of Long Period Companions Using Orbit Fitting Code With HGCA Astrometry**

- Undergraduate Research and Creative Achievements Forum | *Poster Presentation*, **Apr. 2022**
- University of Missouri - Columbia Physics Colloquium | *(virtual) Oral Presentation*, **Oct. 2021**
- AMNH Physical Sciences Colloquium | *(virtual) Oral Presentation*, **Aug. 2021**

*Multi-Wavelength Identification of Extremely Young Galaxies with CANDELS**

- Mid-American Regional Astrophysics Conference (MARACS) | *(virtual) Oral Presentation*, **Apr. 2021**
- Undergraduate Research and Creative Achievements Forum | *(virtual) Oral Presentation*, **Apr. 2021**

*Comparisons of Novel Imaging and Spectroscopic Infrared Eclipse Observations in 2017**

- American Geophysical Union Conference (AGU) | *(virtual) Poster Presentation*, **Dec. 2020**
- University of Missouri - Columbia Astrophysics/Relativity Seminar | *(virtual) Oral Presentation*, **Oct. 2020**
- Solar Physics Division Conference | *(virtual) Poster Presentation*, **Aug. 2020**
- Boulder Solar REU Poster Walk | *(virtual) Poster Presentation*, **Aug. 2020**
- Boulder Solar REU Presentation Day | *(virtual) Oral Presentation*, **Jul. 2020**

**Undergraduate Projects*

Teaching Experience

Astronomy (ASTR101) **Sep. 2024 – Dec. 2024**
Graduate Teaching Assistant

- Curriculum consisted of introductory conceptual and mathematical astronomy topics (modern theories, evolution of stars and galaxies, and astronomical distances, etc).
- Developed review material and lesson plans to lead 4 discussion sections (15 - 30 students each), held office hours throughout the week, and graded assignments and hands-on labs.

The Planets (ASTR150) **Jan. 2025 – Jun. 2025**
Graduate Teaching Assistant

- Curriculum included survey of the solar system, astronomical surveys and missions, and a small overview of exoplanet detection methods.
- Developed review material and lesson plans to lead 3 discussion sections (15 - 30 students each) for both the W25 and Sp25 academic quarters. Held office hours throughout the week, and graded assignments and hands-on labs. Prepared a full class lecture at the end of the quarter.

Mentoring

Current Students
Undergraduate Astronomy/Physics Student†, *Defining TŻO Formation Phases with Hydrodynamical Simulations*
Liam Becker, *Exploring the Effects of Neutron Star Velocities on TŻO Formation using Hydrodynamical Simulations*
Former Students
Pre-Major in Astronomy Program (Pre-MAP) Student†, *Identifying Thorne-Żytkow Object Candidates using APOGEE and Gaia*, (**Oct. 2024 – Dec. 2024**)

†*Anonymized for privacy*

Outreach

UW Planetarium **Sep. 2022 – Present**
Director *Jun. 2025 – Present*

- Introduced and installed new astrovisualization software (OpenSpace) and a robust media server into the planetarium. Led and trained 40+ volunteers to effectively create engaging planetarium shows. Delegated a variety of other management tasks to a team of 4 student coordinators to help give planetarium shows and special events to the public.
- Organized and planned a variety of public outreach events across the University of Washington's campus and the greater Seattle area.

Volunteer Presenter *Sep. 2022 – Jun. 2024*

- Received training to give interactive shows with the World Wide Telescope visualization software.
- Assisted other volunteers in presenting shows for special planetarium programming.

WA NASA Space Grant Consortium **Jun. 2023 – Aug. 2023**
SURP Graduate Leader

- Led and mentored a team of 5 undergraduates throughout the summer to prepare each for their individual poster presentation on their summer research.
- Provided professional development advice, research tips, and speaking opportunities within our weekly meetings.

Maximizing Access to Research Careers (MARC)* **Aug. 2020 – May 2022**
Peer Mentor

- Assisted 6 freshman, sophomore, and junior underrepresented minority students by meeting weekly to help discuss academic progress, answer questions, provide advice about campus life and research opportunities
- Attended weekly meetings with other peer mentors to plan MARC/IMSD meetings, activities, and speakers

**Undergraduate Experience*

Honors & Awards

National Science Foundation (NSF) Graduate Research Fellowship, April 2022
Award for Academic Distinction, *University of Missouri - Columbia*, April 2022
Outstanding Graduating Senior, *University of Missouri - Columbia*, April 2022

Licenses and Certificates

Dale Carniege Course **Issued: August 2019**
Dale Carniege Training
CITI Program **Issued: May 2021**
Physical Science Responsible Conduct of Research

Professional Memberships

- National Society of Black Physicists *(NSBP)*
- American Astronomical Society *(AAS)*