Katelyn J. Wagner

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EDUCATION

Rochester Institute of Technology **Anticipated 2025**
Ph.D. Astrophysical Sciences and Technology Cumulative GPA: 3.79/4.00

Rochester Institute of Technology **Summer 2022**
M.S. Astrophysical Sciences and Technology Cumulative GPA: 3.79/4.00
Thesis Title: *"Template Lattices for a Cross-Correlation Search for Gravitational Waves from Scorpius X-1"*

Roberts Wesleyan College **May 2020**
Bachelor of Science Physics Cumulative GPA: 3.81/4.00
Magna Cum Laude, Global Honors

RESEARCH EXPERIENCE

Parameter Inference for Eccentric Black Hole Binaries Rochester Institute of Technology
Advisor: Dr. Richard O'Shaughnessy August 2022 — Present

Improved Lattice Template Placement for a Search
for Continuous Gravitational Waves from Scorpius X-1 Rochester Institute of Technology
Advisor: John Whelan May 2019 — July 2022

PUBLICATIONS

Katelyn J. Wagner and R. O'Shaughnessy (2023). "Parameter Estimation for Low-Mass Eccentric Black Hole Binaries". In: *Manuscript in preparation*.

Katelyn J Wagner (July 2022). "Template Lattices for a Cross- Correlation Search for Continuous Gravitational Waves from Scorpius X-1". MA thesis. Rochester Institute of Technology.

Katelyn J Wagner, J. T. Whelan, J. K. Wofford, and K. Wette (Aug. 2022). "Template Lattices for a Cross-Correlation Search for Gravitational Waves from Scorpius X-1." In: *Classical and Quantum Gravity*. DOI: 10.1088/1361-6382/ac5012.

Whelan, J. T., R. Tenorio, J. K. Wofford, J. A. Clark, E. J. Daw, D. Keitel, A. M. Sintes, **Katelyn J. Wagner**, G. Woan, T. L. Killestein, and D. Steeghs (2023). "Search for Gravitational Waves from Scorpius X-1 in LIGO O3 Data With Corrected Orbital Ephemeris". In: DOI: 10.48550/ARXIV.2302.10338.

(The LIGO-Virgo-KAGRA Collaboration), R. e. a. (June 2022). "Model-based cross-correlation search for gravitational waves from the low-mass X-ray binary Scorpius X-1 in LIGO O3 data". In: *Astrophysical Journal Letters*. DOI: 10.48550/arXiv.2209.02863.

Quillen, A. C., **Katelyn J Wagner**, and P. Sánchez (Feb. 2019). "Simulations of wobble damping in viscoelastic rotators". In: *Monthly Notices of the Royal Astronomical Society* 485.1, pp. 725–738. DOI: 10.1093/mnras/stz422.

OUTREACH

Mentoring: Haylli Yunga (Current High School Junior) Ossining Science Research Program
Fall 2022 — Present
Developing a long term research project plan and guiding the student toward a research goal in biweekly meetings. Giving mini lectures to teach complex concepts at a high school level and writing code modules to demonstrate important points.
1st Place Somer's Science Fair 2023 (Physics) *Eccentricity & Spin Precession in Binary Black Hole Mergers*

Teaching: Introduction to Astrophysics Rochester Institute of Technology
Fall 2022 — Present
Constructing code modules and writing lecture materials to teach high school students about types of astronomy research.
November 2023: Invited and hosted 20 students from the Syracuse City School District in collaboration with LeMoyne College Upward Bound for an introductory astrophysics workshop and RIT campus tour.

Public: ImagineRIT Virtual Exhibit 2021
"Making Waves - Gravitational Waves!" Rochester Institute of Technology

Lecture: Big Data in Astronomy January 2021
Cicero-North Syracuse High School AP Computer Science Class, Girls Who Code Club Syracuse, NY

LEADERSHIP & SERVICE

Graduate Student Peer Mentor Rochester Institute of Technology
Astrophysical Sciences & Technology Program Fall 2021 — Present
Provide advice, inside knowledge, encouragement, and moral support to fellow graduate students in the AST program to help them navigate their first year. I meet bimonthly with my mentees in an informal setting for the entirety of their first academic year. I have mentored two students per year.

TALKS

Parameter Estimation for Low-Mass Eccentric Black Hole Binaries Rochester Institute of Technology
AST Graduate Research Jamboree October 2023

Template Lattices for a Cross-Correlation Search for Gravitational Waves from Scorpius X-1 Rochester, NY
Master's Thesis Defense July 2022

Template Lattices for a Cross-Correlation Search for Gravitational Waves from Scorpius X-1 Rochester, NY
AST Graduate Research Jamboree October 2021

Template Lattices for a Cross-Correlation Search for Gravitational Waves from Scorpius X-1 Virtual
14th Edoardo Amaldi Conference on Gravitational Waves July 2021

Template Lattices for a Cross-Correlation Search for Sco X-1 Virtual
LIGO-Virgo-KAGRA Collaboration Meeting March 2021

Improved Lattice and Coordinate Choices for a Search for Continuous GWs from Sco X-1 Virtual
AST Graduate Research Jamboree October 2020

Improved Lattice and Coordinate Choices for Cross-Correlation Search for Sco X-1 Virtual
LIGO-Virgo-KAGRA Collaboration Meeting September 2020

Full O3 Scorpius X-1 CrossCorr Update Virtual
LIGO Continuous Wave Group Telecon September 2020

Template Placement for a Search for Continuous Gravitational Waves Rochester, NY
RIT Undergraduate Research Symposium August 2019

Simulations of Precession Damping for a Homogeneous Viscoelastic Rotators University of Rochester
Undergraduate Summer Research Symposium August 2018

PROFESSIONAL DEVELOPMENT

Data Carpentry: Pilot Workshop for Astronomers The Carpentries (Virtual)
Python-based astronomy workshop to learn database skills with ADQL using Gaia and PanSTARRS data. November 2020

Summer School in Statistics for Astronomers XVI Penn State
Lectures and tutorials interspersed with analysis of astronomical data, with discussion of methodological issues. June 2021

Code/Astro Caltech (Virtual)
Software development workshop to learn fundamental software engineering skills and best practices. June 2021

AWARDS

RIT Outstanding Graduate Woman Achievement Award *Nominee*
Sigma Pi Sigma Honor Society (SPS)
Chi Alpha Sigma Honor Society
Benjamin Titus Roberts Full-tuition Grant *Roberts Wesleyan College*
Ensemble Scholarship, Violin *Roberts Wesleyan College*
Dean's List, High Honors *Roberts Wesleyan College*

COMPUTER SKILLS

Languages: Python (Numpy, Pandas, Matplotlib, Scipy, RIFT, JAX), Bash, git, HTCondor, LaTeX
Operating Systems: Linux-Debian, Mac OS, Windows
Development Tools: Gitlab CI/CD, Jupyter
Web & Documentation: Sphinx + ReadTheDocs, React JS
Statistical Modeling: Time series analysis, Bayesian inference