Riley Rosener

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Education

University of Chicago — Chicago, United States
B.S. in Astrophysics with Honors, Minor in History, GPA: 3.7/4.0 — 2020–2024

Research Experience

University of Chicago — Chicago, United States
Undergraduate Researcher in the Bean Exoplanet Group — September 2023 – Current

- Configured and ran pyTPCI escaping atmosphere simulations and analyzed data outputs for emission signal detectability
- Wrote faculty-reviewed honors thesis "On the Detectability of Emission from Exoplanet Outflows"
- Submitted manuscript to The Astrophysical Journal for publication

W.M. Keck Observatory — Hawai'i, United States
Jeff Metcalf Intern for NIRC2 Instrument — Summer 2023

- Rewrote and translated QACITS coronagraph observational software backend from IDL into Python 3
- Implemented fast data reduction and fitting, added comprehensive logging capabilities
- Documented and organized code to live-interface with Keck's sub-system API, display data, and meet user needs
- Live-tested code on equipment, and learned about NIRC2 instrument operation to ensure functioning

University of Chicago — Chicago, United States
Researcher and Contributor in the COOL-LAMPS strong lensing group — Winter 2023 – Summer 2023

- Filtered archival data in IDL with statistical calculations across vast parameter space to find extremely rare quasars
- Resulted in confirmed discovery, accepted Hubble proposal, and publication COOL-LAMPS VIII

University of Chicago — Chicago, United States
Quad Summer Scholar and Researcher in UChicago's Neutrino Research Group — Summer 2021 – April 2023

- Analyzed Python MCMC outputs to examine detectability of theoretical Higgs scalar particle at Fermilab
- Created and maintained the Neutrino Group's current Voices website for potential researchers

Publications

1. M. Z. **Riley Rosener**, J. L. Bean, *Detectability of Emission from Exoplanet Outflows Calculated by pyTPCI, a New 1D Radiation-Hydrodynamic Code*, First author, submitted to The Astrophysical Journal for publication Oct 2024.
2. A. P. Cloonan, G. Khullar, K. A. Napier, M. D. Gladders, H. Dahle, **Riley Rosener**, J. S. J. au2, M. B. Bayliss, N. Chicoine, I. Escapa, D. Garza, J. Garza, R. Glusman, K. Gozman, G. Horwath, A. Kisare, B. C. Levine, O. Liang, N. Malagon, M. N. Martinez, A. Masegian, O. S. M. Acuña, S. D. Mork, K. Niu, M. R. Owens, Y. Pan, J. R. Rigby, K. Sharon, I. Sierra, A. A. Stark, E. Sukay, M. Tamargo-Arizmendi, K. Tavangar, R. Teixeira, K. Tsiane, G. Wagner, E. A. Zaborowski, Y. Zhang, M. Zhao, *COOL-LAMPS VIII: Known wide-separation lensed quasars and their host galaxies reveal a lack of evolution in $M_{\rm BH}/M_\star$ since $z \sim 3$*, 2024, arXiv: 2408.03379 `(astro-ph.GA)`, (https://arxiv.org/abs/2408.03379).
3. **Rosener, Riley**, *On the Detectability of Emission from Exoplanet Outflows*, 2024, DOI 10.6082/UCHICAGO.11790, (https://knowledge.uchicago.edu/record/11790).

Awards and Funding

- Jeff Metcalf Scholar 2023
- Quad Summer Scholar 2022
- National Merit Scholar 2020–2024

Presentations and Posters

- ERES IX Talk July 2024
- UChicago Research Symposium Poster April 2023
- NuMI ICARUS Working Group Talk November 2022

Leadership and Service

President of UChicago's Ryerson Astronomical Society

- Organized educational talks from astronomy faculty and held public observation nights for 20-30 students weekly. Conducted routine maintenance on historic observatory facilities and equipment. 2020–2024

Research Assistant in UChicago's History Department

- Coordinated logistics and supported facilitation of 75 student immersive history class. Engaged with students, planned and wrote class materials, organized event details. 2022–Current

Teaching Assistant in UChicago's Astronomy & Astrophysics Department

- Helped teach 35 student undergraduate astronomy course on Black Holes. Graded course materials, answered student questions, and supported logistics. Summer 2024

Skills

- **Programming Languages:** Python 3, SQL, IDL, Linux and Windows
- **General Tools:** Git, Excel/Office Suite, Bayesian analysis, data fitting and visualization, version control
- **Languages:** Latin, Ancient Greek, Russian