

Riley Rosener

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EDUCATION

University of Chicago

B.S. in Astrophysics with Honors, Minor in History, GPA: 3.7/4.0

Chicago, United States

2020–2024

RESEARCH EXPERIENCE

University of Chicago

Undergraduate Researcher in the Bean Exoplanet Group

Chicago, United States

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

Jeff Metcalf Intern for NIRC2 Instrument

Hawai‘i, United States

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

Researcher and Contributor in the COOL-LAMPS strong lensing group

Chicago, United States

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

Quad Summer Scholar and Researcher in UChicago’s Neutrino Research Group

Chicago, United States

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_{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

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

PRESENTATIONS AND POSTERS

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| • UMich Stars, Planets, and Formation Talk | November 2024 |
| • 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

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| • 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 |
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Research Assistant in UChicago's History Department

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| • Coordinated logistics and supported facilitation of 75 student immersive history class. Engaged with students, planned and wrote class materials, organized event details. | 2022–Current |
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Teaching Assistant in UChicago's Astronomy & Astrophysics Department

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