RACHEL R. LEE

Department of Physics and Astronomy, 525 Northwestern Ave.
Purdue University, West Lafayette, IN 47907
lee2676@purdue.edu

EDUCATION

Purdue University *August 2017 - May 2021*
Bachelors of Science, Physics Honors — Overall GPA: 3.67/4.00
Minors in Astronomy and Mathematics — Physics Honors GPA: 3.63/4.00
College of Science, Honors College

RESEARCH INTERESTS

Observational and Time Domain Astronomy: Supernovae, Supernova Remnant Morphology and Energetics, Progenitor System Analysis, Stellar Evolution and Formation, Spectroscopy, Stellar Classification, Exoplanets

RESEARCH EXPERIENCE

Astronomy Research Assistant, Purdue University; Department of Physics and Astronomy Jan. 2018–Present
Advisor: Professor Dan Milisavljevic

- Obtain and analyze data from Gaia Space Observatory to create documentation of stellar source candidates for spectroscopic analysis in order to determine locations of stars relative to the neighborhood of a supernova remnant.
- Create and collaborate on observational proposals for usage of Gemini telescopes and GMOS for multi-slit spectroscopy as well as the newly commissioned NEID instrument on the WIYN 3.5m telescope.
- Classify stellar sources based on high resolution spectra obtained from the NEID instrument on the WIYN 3.5m telescope and medium resolution reference star spectra.
- Assist in developing a platform to coordinate ground-based facilities and follow up transients discovered by the Legacy Survey of Space and Time (LSST) and provide resources to determine probable observational capabilities.
- Create and maintain a master list of optical observatories across the world.
- Compile information about galactic supernova candidates for the Supernova Early Warning System (SNEWS).
- Present research findings at laboratory meetings and to astrophysics students.
- Attend conferences, seminars, colloquiums, and journal club meetings.

Psychology Research Assistant, University of Notre Dame; Department of Psychology Sep. 2016–Present
Advisor: Professor Julie Braungart-Reiker

- Conduct research in psychology-based experiments, Families and Babies Student (FABS; NIH-R01 grant, 2016) with community families.
- Record, manage, and organize video data collection and video inventory for research activities.
- Complete, organize, manage, and enter behavioral coding of observational data.
- Train new staff and research assistants on video recording equipment, control room, and procedural tasks.
- Assist in the adaptation of experimental procedure to virtual format.

TECHNICAL AND TELESCOPE EXPERIENCE

Technical Experience

- Astronomical Data Processing Packages: DS9 SAOImage, Astropy, Specutils, PYRAF, IRAF, Jupyter Lab
- Programming Languages: Python, LaTeX, MATLAB, SPSS, Maple, Shell Script
- Computer Platforms: Mac OS, Microsoft Windows, Linux

Telescope Experience

- McGraw-Hill 1.3m Telescope, MDM Observatory: 3 Observing runs, 2-3 nights each
- Astro-Boilermaker 16in Telescope, Purdue Wildlife Observatory

Teaching Experience

Physics Course and Individual Tutor, Purdue University Jan. 2021–Present

- Tutor students in introductory mechanical physics courses containing 300+ students as a class and individually.
- Contact students weekly about the schedule of tutoring sessions and what to expect for each session.
- Encourage students to attend tutoring sessions, ask questions, and seek help when they feel they need it.
- Compile an exhaustive list of what is discussed with each student and when they attended sessions.
- Answer individual questions and prepare recitation style lectures for all students attending the session.

Polytechnic Physics and Math Tutoring Supervisor, Purdue University Aug. 2021–Present

- Manage and supervise all tutors in the Polytechnic Department Physics and Math Tutoring Program.
- Schedule meetings and sessions for other tutors on the team.
- Contact department heads and professors to obtain course specific information to help the program succeed and encourage students to attend the tutoring sessions.

Outreach

REFITT Education and Outreach Liaison Summer 2021–Present

- Coordinate professional and amateur astronomers on a global scale to perform time-sensitive observations of astronomical transients.
- Analyze and compare REFITT data to actual photometric observations in a mission to make REFITT as efficient and accurate at possible.
- Create and maintain a list of possible galactic supernova candidates as important targets for REFITT observing.
- Create and maintain an exhaustive list of observatories and amateur astronomers worldwide.
- Contact and follow up with observatories and astronomers who present interest in this project.
- Provide a probabilistic analysis of weather and climate patterns in high priority locations.

Activities

Conference for Undergraduate Women in Physics

University of Chicago, Jan. 2020

- Attended professional conference to enrich my knowledge in the fields of physics, learn about opportunities as a woman in physics, and receive information about graduate school and physics based professions.
- Engaged in event activities designed to allow for networking opportunities.
- Collaborated with other women in physics as a way to share experiences and ideas.

Purdue Undergraduate Physics Student Council

Co-Founder, Treasurer (Jan. 2019–May 2021)

- Co-founded and created the Undergraduate Physics Student Council; a council based around the goal of increasing retention within the Department of Physics and Astronomy by communicating and planning with the department head and other faculty members.
- Create a bridge between the faculty members and undergraduate students of the department to improve communication pathways.
- Planned and led fundraisers and events designed the spread awareness of the club.
- Created a petition with six peers to reopen the Purdue Physics Library and make space for physics students to collaborate. After gaining over 700 signatures from students and faculty, we presented the petition to the Dean of the College of Science. Our efforts were successful and the library reopened.

Purdue Student Government

Strategic Planning and Assessment Director (Aug. 2017–May 2018)

- Assisted in the creation of Qualtrics surveys designed to optimize the Purdue student experience.
- Created initiatives that promote long-term sustainability and development of Purdue Student Government.
- Helped construct and implement Purdue Student Government's two year strategic plan.
- Held office hours where students could ask questions relating to the strategic plan and student government.

HONORS AND AWARDS

· Margie and Don Bottorff Undergraduate Physics Scholarship	Aug. 2019–May 2021
· David G. Seiler Physics Scholarship	Aug. 2019–May 2020
· Lijuan Wang Memorial Award	Aug. 2019–May 2020
· Ascarelli Fellowship Recipient	Aug. 2017–May 2018
· Honors College	Aug. 2017–May 2021
· Semester Honors Recipient	Jan. 2019–May 2021
· Purdue University Dean's List	Jan. 2020–May 2021
· Purdue Promise Scholarship Recipient	Aug. 2017–May 2021
· 21st Century Scholar Recipient	Aug. 2017–May 2021

MEMBERSHIPS

· Purdue Undergraduate Physics Student Council, Co-Founder and Treasurer	Jan. 2019–May 2021
· Women in Physics, Member	Aug. 2017–May 2021
· Purdue University Astronomy Club, Member	Aug. 2018–May 2021
· Society of Physics Students, Member	Aug. 2018–May 2021
· American Astronomical Society, Member	Oct. 2021 – Present

REFEREED PUBLICATIONS

1. **Lee, R. R.**, Milisavljevic, D., Weil, K. E., Banoventz, J. "Direct Supernova Remnant Distance Estimates Using NEID Spectroscopy of Gaia Stars," *in prep.* (2022)

NON-REFEREED PUBLICATIONS

9. Garretson, B., Milisavljevic, D., Reynolds, J., Surbrayan, B., Weil, K. E., Banovetz, J., **Lee, R. R.** "Supernova Host Galaxy Association and Photometric Classification of Over 10,000 Light Curves from the Zwicky Transient Facility," RNAAS, (*Submitted, Nov. 17, 2021*).
8. Weil, K. E., Milisavljevic, D., Rupert, J., et al. and 17 other authors incl. **Lee, R.** "REFITT classification of SN 2021nxq (ZTF21abcpsjy)," Transient Name Server AstroNote, 182 (2021)
7. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.** "REFITT classifications of optical transients using SOAR," Transient Name Server AstroNote, 30 (2021)
6. Weil, K. E., Subrayan, B. M., Milisavljevic, D., et al. and 17 other authors incl. **Lee, R.**"REFITT classifications of optical transients using SOAR," Transient Name Server AstroNote, 266 (2020)
5. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.** "REFITT Discovery and Classification of SN2020abog (ZTF20acpgjac) using SOAR," Transient Name Server AstroNote, 243 (2020)
4. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.** "REFITT classifications of optical transients using SOAR," Transient Name Server AstroNote, 242 (2020)
3. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.**"REFITT classifications of optical transients using SOAR," Transient Name Server AstroNote, 232 (2020)
2. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.** "REFITT Discovery and Classification of SN 2020zct (ZTF20acezhcf) using SOAR," Transient Name Server AstroNote, 227 (2020)
1. Weil, K. E., Milisavljevic, D., Andrews, M., et al. and 18 other authors incl. **Lee, R.** "REFITT classifications of optical transients using SOAR," Transient Name Server AstroNote, 225 (2020)

CONFERENCE PROCEEDINGS

1. **Lee, R. R.** "Direct Supernova Remnant Distance Estimates Using NEID Spectroscopy of Gaia Stars," 239 AAS Meeting Abstracts, 2022.

OBSERVING PROPOSALS

6. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2022A. Time: 1 night (2021B, Pending). "*Enhancing the ZTF Public Survey for Science Inferencing with REFITT*."
5. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2022A. Time: 4 Nights (2021B, Pending). "*Spectroscopic Follow-up of Faint Transients from the ZTF Public Survey using REFITT*."
4. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2021B. Time: 4 Nights (2021A, Accepted). "*Spectroscopic Follow-up of Faint Transients from the ZTF Public Survey using REFITT*."
3. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2021B. Time: 3 Nights (2021A, Accepted). "*Enhancing the ZTF Public Survey for Science Inferenc- ing with REFITT*."
2. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2021A. Time: 0.5 Nights (2020B, Accepted). "*Precise Distance Estimates to Nearby Supernova Remnants*."
1. National Optical-Infrared Astronomy Observatory Proposal, **Co-I**, 2021A. Time: 40 Hours (2020B, Accepted). "*An ORACLE for Antares*."