Rachel R. Lee

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Education

Purdue University | West Lafayette, IN | Expected Graduation: May 2021
Bachelors of Science, Physics Honors
Minors in Astronomy and Mathematics
College of Science, Honors College
GPA: 3.57/4.00
Physics GPA: 3.55/4.00

Research Interests

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

Research

Department of Physics and Astronomy, Purdue University
Jan. 2018 - Present
PI: 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 a supernova remnant.
- Compare Chandra X-Ray images to optical images to determine which candidates will result in the most advantageous spectroscopic observations.
- 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.
- Assist in developing a platform to coordinate ground-based facilities and follow up transients discovered by the Large Synoptic Survey Telescope (LSST).
- Create and maintain a master list of optical observatories across the world.
- Read and chart weather data from locations across the world to provide information about probable observational capabilities.
- Compile galactic supernova candidate information.
- Present research findings at laboratory meetings and to astrophysics students
- Review and synthesize literature to advance my research.
- Manage, analyze, and interpret large data sets.
- Collaborate with team members and act in a leadership role with junior research assistants

Department of Psychology, University of Notre Dame

Sept. 2016 - Present

PI: Dr. Julie Braungart-Rieker (FABS, SPARC, FAMJAM)

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

Publications

Observing Proposals:

1. National Optical Astronomy Observatory Observing Proposal, **Co-I**, 2021A. Time: 0.5 Nights (2020B, Accepted). "*Precise Distance Estimates to Nearby Supernova Remnant*s"
2. National Optical Astronomy Observatory Observing Proposal, **Co-I**, 2021A. Time: 40 Hours (2020B, Accepted) "*An ORACLE for ANTARES*"

Letters of Intent:

1. National Science Foundation's National Optical-Infrared Astronomy Research Laboratory, **Co-I**, 2020B. Time: 20 Nights (2020A, Pending). "*An Autonomous Strategy and Coordination Engine for NSF's National OIR Research Laboratory*"

Non-Refereed:

1. Weil, Milisavljevic, Andrews, et al. and 18 other authors incl. **Lee** (2020), Transient Name Server AstroNote, 227, "*REFITT Discovery and Classification of SN2020sct (ZTFacezhcf) using SOAR*"
2. Weil, Milisavljevic, Andrews, et al. and 18 other authors incl. **Lee** (2020), Transient Name Server AstroNote, 225, "*REFITT Discovery and Classification Using SOAR*"
3. Weil, Milisavljevic, Andrews, et al. and 18 other authors incl. **Lee** (2020), Transient Name Server AstroNote, 232, *"REFITT Discovery and Classification Using SOAR*"

Honors and Awards

- Ascarelli Fellowship Winner	Fall 2017 - Spring 2018
- Honors college	Fall 2017 - Spring 2021
- Margie and Don Bottorff Physics Scholarship two time recipient	Fall 2019 - Spring 2021
- David G. Seiler Physics Physics Scholarship recipient	Fall 2019 - Spring 2020
- Lijuan Wang Memorial Award	Fall 2019 - Spring 2020
- Semester Honors	Spring 2019 - Present
- Purdue University Dean's list	Spring 2020 - Present
- Purdue Promise	Fall 2017 - Spring 2021
- 21st Century Scholar	Fall 2017 - Spring 2021

Activities

Conference for Undergraduate Women In Physics

University of Chicago, January 2020

- Attended conference to enrich my field of knowledge in physics and learn about opportunities as a woman in physics.
- Engaged in event activities designed to allow networking opportunities.

Purdue Undergraduate Physics Student Council

Co-Founder, Treasurer (Spring 2019 - Present)

- 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.
- Planned and led fundraisers and events designed to spread awareness of the club.
- Created a petition with six peers to reopen the Purdue Physics Library and make a 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.

Purdue Student Government

Strategic Planning and Assessment Director (Fall 2017 - Spring 2018)

- Assisted in the creation of Qualtrics surveys designed to optimize the experience students have at Purdue University.
- Collaborated with team members to create initiatives that promote long-term sustainability and development of Purdue Student Government.
- Helped construct and implement Purdue Student Government's two year strategic plan.

Coursework, Skills, and Certifications

Coursework

- **Physics Coursework:** Classical Mechanics; Electricity and Magnetism; General and Special Relativity; Modern Dynamics; Quantum Mechanics; Thermal and Statistical Mechanics
- **Astronomy Coursework:** Extragalactic and Large-Scale Structure; Intermediate Astronomy I and II, Cosmology
- **Math Coursework:** Ordinary Differential Equations; Integral, Vector, and Multivariate Calculus; Linear Algebra; Real Analysis

Skills: DS9 SAOImage, Python coding, Adobe Premiere Pro, El Gato Video Software, SPSS, presentation of research findings, manage and interpret large data sets

Certifications: CPR, AED, and Lifeguard certified

Memberships

- Purdue Undergraduate Physics Student Council — Spring 2019 - Present
- Women in Physics — Fall 2017 - Present
- Astronomy Club — Fall 2018 - Present
- Society of Physics Students — Fall 2018 - Present