BHAGYA M. SUBRAYAN

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EDUCATION

PhD Candidate, Physics and Astronomy, Purdue University, CGPA: 3.82/4.0 Aug. 2018 – Present

Integrated BS-MS Program, Major in Physics and Minor in Chemistry, GPA: 8.59/10 Aug. 2013 – May 2018
Indian Institute of Science Education and Research (IISER), Thiruvananathapuram, India

TECHNICAL EXPERIENCE

Technical Expertise: Optical Image Processing, Optical Spectroscopy, Statistical Data Analysis, Machine Learning, High Performance Computing, Data Mining and Wrangling, Python, C , C++

Software: PyRAF, IRAF, ds9, LaTeX, TensorFlow, scikit-learn, GitHub, dynesty, Astropy, MOSFiT, SuperBol

Telescope Experience: McGraw-Hill 1.3-m Telescope, MDM Observatory (Remote): 9 Observing Runs, 2–5 nights each; Southern Astrophysical Research (SOAR) 4-m Telescope; Las Cumbres Observatory; Skynet & iTelescope

Publications: 3 first author (two published, one in prep.), 4 joint author refereed publications; 7 joint author non-refereed publications; 4 conference talks, 3 Posters, 1 invited talk (Astro On Tap, West Lafayatte, IN).

RESEARCH EXPERIENCE

Graduate Research Assistant, Purdue University Summer 2019 – Present

- Performed multi-wavelength population studies and analysis of Core-Collapse Supernovae (CCSNe) from large scale all-sky imaging surveys.
- Analyzed MIRI IFU data cubes of supernova remnant Cassiopeia A obtained through JWST Cycle 1 GO Proposal (PI: Prof. Danny Milisavljevic) to understand elemental abundances, explosion mechanisms and progenitor systems involved in the core-collapse supernova explosion by connecting the observations to theoretical models.
- Integrated acquisition, processing, and analysis of CCD images. Proficient in aperture photometry with specific focus on transients in time-domain astronomy ecosystem. Built a data processing pipeline with Python for large batches of noisy astronomical images to clean and denoise them to perform source measurements.
- Demonstrated competency in optical spectroscopy of transients. Published several Transient Name Server (TNS) AstroNotes on behalf of REFITT Faint CCSNe Classification programme.
- Implemented statistical data analysis and machine learning algorithms. Developed an automated way to infer explosion & progenitor properties of transients using theoretical models integrating statistical optimization methods.
- Managed science-driven recommendations to observers every night from the AI system named Recommender Engine for Intelligent Transient Tracking (REFITT). Collaborated in decision-making involving the REFITT website development and user base management.

LEADERSHIP

Women In Science Program (WISP, College of Science, Purdue University): Summer 2020 – Present

- Designed and hosted a monthly series of events with invited speakers to discuss life-skill and science based topics to support women and non-binary STEM graduate students.

Master of Ceremony (MC) for JWST Virtual Launch Party (Purdue University): December 25, 2021

- Moderated a virtual launch party with 6 science experts to celebrate launch of NASA's prestigious James Web Space Telescope Mission organized by Department of Physics and Astronomy. Video available on Youtube.

President, Physics Graduate Student Association (Purdue University) Summer 2022 – Present

- Establishing PGSA's overall objectives, mission statement and value system. Mentor to junior graduate students as well as undergraduate students. Liaison to Physics Faculty representing graduate student community.

Saturday Morning Astrophysics Outreach at Purdue (Purdue University): Spring 2021 – Present

- Presented virtual lessons for 7-12 graders about current topics in astronomy and fundamental astrophysics. Coordinated public observing nights at Cumberland Observatory.

HONORS AND AWARDS

- Lijuan Wang Memorial Award, Physics and Astronomy, Purdue April 2021
- Summer Research Grant, Physics and Astronomy, Purdue July – Aug. 2020
- Innovation in Science Pursuit for Inspired Research (INSPIRE) Scholar, Govt. of India Aug. 2013 – May 2018
- Indian Institute of Astrophysics (IIA) Summer Scholar May – July 2016