Purvi Garg

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Education

Michigan State University,East Lansing,MI *Aug 2022-Present*

- Bachelor of Science, Astrophysics and Data Science
- GPA: 3.76

Experience

Undergraduate Research Assistant *Sep2023-Present*

- Advisor:- Asst. Prof. Seth A. Jacobson , Michigan State University
- Dynamical Evolution of Young Binary Systems Using the General Use Binary Asteroid Simulator (GUBAS)
- GUBAS models binary systems through the full two-body problem, simulating gravitational forces and torques between two arbitrary mass distributions.
- Using GUBAS, a hybrid tool that integrates Python and C++: Python for command handling and post-processing, and C++ for computational dynamics and integration.
- Investigating how the resulting structures compare to Kuiper Belt cold classicals and examining the post-gravitational collapse formation of planetesimals

Undergraduate Research Assistant *Nov2022-Sep2024*

- Advisor:- Mehr Un Nisa , Michigan State University
- Investigated transient neutrino emission from X-ray binaries and TeV blazars using cascade and track methods.
- Constructed temporal PDFs from light curves provided by Fermi-LAT, MAXI, and SWIFT.
- Analyzed top 5 sources from the Kantzas model with the highest predicted flux for inverse Compton scattering.
- Employed KDE, baseline subtraction, and Bayesian blocks for sensitivity and discovery potential analysis.
- Contributed to data interpretation and method development for high-energy astrophysical phenomena.

MSU Observatory Research Program *May 2024-Present*

- Gained hands-on research experience in observational astrophysics through MORP.
- Engaged in authentic research, observing transits and exoplanets in a modern lab setting.
- Processed and cleaned observational data, contributing to the accuracy of research findings.
- Explored and utilized observatory resources for data analysis and interpretation in exoplanet studies.

Undergraduate Learning Assistant *Sep 2024-Present*

PHY 231 & 232 C , Introductory Physics I

- Offered guidance and academic support to students, fostering a collaborative learning environment and encouraging active participation in class.
- Held regular office hours to provide one-on-one tutoring, clarifying doubts and reinforcing key concepts for students needing additional help.
- Assisted in leading small group discussions and problem-solving sessions, helping students understand complex physics concepts and apply them to solve problems.

Undergraduate Learning Assistant *Jan2024-April2024*

Course ISP-205 (Vision of Universe)

- Assisted students in identifying research interests and finding suitable research opportunities.
- Guided students in connecting with potential mentors and securing research positions.
- Supported the Undergraduate Research Department in managing student enrollment in research programs.
- Facilitated workshops and one-on-one meetings to help students navigate the research landscape and develop their academic goals.

Undergraduate Research Advisor *Sep2023-June2024*
Pathway to Research , Department of Undergraduate Research

- Assisted students in identifying research interests and finding suitable research opportunities.
- Guided students in connecting with potential mentors and securing research positions.
- Supported the Undergraduate Research Department in managing student enrollment in research programs.
- Facilitated workshops and one-on-one meetings to help students navigate the research landscape and develop their academic goals.

Talk And Posters

- **Conferences for Undergraduate Women and Gender Minorities in Physics (CuWiP)** (University of Michigan, USA) – January 2024. Poster on "Search for Transient Neutrino Emission from TeV Blazars and X-ray Binaries."
- **University Undergraduate Research and Arts Forum (UURAF)** (Michigan State University, USA) – April 2024. Poster on "Search for Transient Neutrino Emission from TeV Blazars and X-ray Binaries."
- **Third Data Science Conference** (Michigan State University, USA) – November 2023. Poster on "Search for Transient Neutrino Emission from TeV Blazars and X-ray Binaries."
- **IceCube Collaboration Meeting** (Grand Rapids,USA) – September 2023. Talk on "Joint Search for Transients with IceCube and HAWC: TeV Binaries and Blazars."
- **Conferences for Undergraduate Women and Gender Minorities in Physics (CuWiP)** (Argonne National Laboratory, USA) – January 2023. Attendee.

Leadership

Dean Research Scholar , College of Natural Science *2024-2025*

- Represented the College of Natural Science at various events and speaking engagements across the U.S. Received an award for excellence. Served as an ambassador for nearly 6,000 science and mathematics majors, upholding university standards and guidelines.

NASA Eclipse Ambassador *2023-2024*

- Trained virtually in workshops to educate the public about eclipses. Partnered with undergraduate and amateur astronomers, and collaborated with Abrams Planetarium, University of Toledo, and the Society of Physics Students club. Engaged with 200+ community members, including underserved populations.

Outreach

- **MSU Observatory, September 2022 – Present**, Engaged with the public by exhibiting planets through telescopes and leading astronomy activities during open nights and public events.
- **Abrams Planetarium, September 2022 – Present**, Conducted astronomy outreach at schools, university night events, Fledge, and SYAC, showcasing various astronomy activities and engaging with diverse audiences.

Technical Skills

- Python : Proficient
- C++ : Intermediate
- Github : Proficient
- R Studio : Intermediate
- MatLab : Beginners