Akshat Chaturvedi

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Physics & Astronomy, Suite 605, 25 Park Place

Atlanta, Georgia 30303

EDUCATION

Pennsylvania State University – Cumulative GPA: **3.71**

- BS in Astronomy & Astrophysics - May 2024
- BS in Physics – May 2024
- Mathematics minor – May 2024

RESEARCH EXPERIENCE

Pennsylvania State University

- **Undergraduate Research Assistant (Fall 2022 – Spring 2024)**

  A Census of Blue Post-Horizontal Branch Stars in Galactic Globular Clusters

  Advisors: Dr Robin Ciardullo and Dr Howard Bond

  - Analyzed photometric measurements for 108 Galactic globular clusters
  - Created color-magnitude diagrams for individual clusters
  - Performed density-based clustering algorithms (DBSCAN) on proper motions of cluster objects using Gaia DR3 proper motions.
  - Assessed membership criteria for objects in the field of view of globular clusters
  - Identified blue (B-V < -0.05), post-AGB stars from filtered color-magnitude diagrams to create a census to test the hypothesis that blue post-AGB stars are viable standard candle candidates
  - Papers in preparation, expected submission spring 2024

- **Undergraduate Research Assistant (Fall 2023 – Spring 2024)**

  Spectroscopic Survey of the Planetary Nebula Abell 57

  Advisors: Dr Robin Ciardullo and Dr Howard Bond

  - Analyzed emission lines from central knot of the planetary nebula Abell 57
  - Attained optimum conditions for a model PN spectra using CLOUDY to compare to observed spectra and expand the EGB 6 class of PN central stars

- **Undergraduate Research Assistant (Summer 2022)**

  A Measure of the Age of the Sco-Cen Complex, A Census of the 32 Ori Association and *The Proper Motions of the Oceanus Moving Group*

  Advisor: Dr Kevin Luhman

  - Computed the age of the Scorpius-Centaurus star association using traceback methods from the proper motions of the constituent stars
  - Identified member stars of the 32 Ori star association using clustering algorithms such as DBSCAN and HDBSCAN
  - Analyzed the proper motions of the Oceanus moving group to determine whether the candidate member stars were well clustered in their proper motions

TEACHING EXPERIENCE

Pennsylvania State University

- **Undergraduate Learning Assistant (2022-2023)**

  ASTRO 291/292 - Instructor: Dr Donald Schneider

  - Cultivated an active and open learning environment out of class through office hours
  - Mentored underclassmen through their sophomore-level astronomy and astrophysics sequence while explaining concepts such as gravitation, celestial mechanics, electromagnetic radiation, astronomical instrumentation, planetary motion and cosmology
- **Undergraduate Learning Assistant (Spring 2022)**

  PHYS 212 – Instructor: Dr Eric Hudson

  - Used proven pedagogical techniques to enhance the learning environment inside class, as well as hosting office hours
  - Mentored underclassmen through their freshman-level electromagnetics course while explaining concepts such as Gaussian surfaces, Maxwell's equations, circuit analysis and Kirchoff's laws
- **Undergraduate Learning Assistant (Fall 2021)**

  PHYS 211 – Instructor: Dr Daniel Larson

  - Used proven pedagogical techniques to enhance the learning environment inside class, as well as hosting office hours and grading quizzes
  - Mentored underclassmen through their freshman-level mechanics course while explaining concepts such as Newton's laws, vector analysis and circular motion

LEADERSHIP

Pennsylvania State University

- Vice-President of the Society of Physics Students (Fall 2023 – Spring 2024)
    - Organizing events such as research talks, fundraisers, club outings, weekly meetings
    - Coordinating with the Physics and Astronomy departments to enable a chain of communication between undergraduates and faculty
    - Advocating for undergraduate representation and welfare in daily departmental activities
- Residential Assistant (Fall 2023 – Spring 2024)
    - Managing a floor of 40 residents, ensuring safety and comfort
    - Establishing an open and inclusive floor which follows Penn State Residence Life's guiding principles
    - Creating a sense of community among residents through community builders such as game nights, inter-floor sports tournaments and group dinners

DIVERSITY, EQUITY, INCLUSION

Pennsylvania State University

- Undergraduate Representative, Astronomy Department Climate & Diversity Committee
    - Collaborated with members of the department to promote DEI initiatives to undergraduates
- Residential Assistant
    - Promoted an inclusive space with residents and used community builders to spread awareness about various DEI-related issues and resources available on campus

HONORS AND AWARDS

Pennsylvania State University

- George E., Jr. and Elizabeth S. Sperling Tutorial Endowment in Physics Scholarship for the 2021-22 academic year
- Member of Sigma Pi Sigma, the national physics and astronomy honors society
- Member of Phi Beta Kappa, the national liberal arts and sciences honors society
- Eberly College of Science Dean's List for Spring 2021, Fall 2021, Spring 2022, Fall 2022, Fall 2023 and Spring 2024

PRESENTATIONS AND PUBLICATIONS

- *"Spectroscopic Survey of Faint Planetary-Nebula Nuclei. V. The EGB 6-Type Central Star of Abell 57"* by Bond, Chaturvedi, Ciardullo, Werner, Ziemann and Siegel
- "*A Census of Blue Post-Horizontal Branch Stars in Galactic Globular Clusters*" by Chaturvedi, Bond, Ciardullo, Nagaraj and Siegel (in prep)
- *"A uBVI Photometry Survey of Post-Main Sequence Stars in Milky Way Globular Clusters"* by Bond, Ciardullo, Chaturvedi and Siegel (in prep)
- American Physical Society – Mid-Atlantic Section (December 2022), State College, PA
    - Presented a poster on "*A Census of Blue Post-Horizontal Branch Stars in Galactic Globular Clusters"*

RELEVANT COURSES

- Astronomical Methods and the Solar System
- Astronomy of the Distant Universe
- Observational Astronomy Laboratory
- Computational Astrophysics
- Stellar Structure and Evolution (Spring 2024)
- Galaxies and Cosmology (Spring 2024)
- Introduction to High-Energy Astronomy
- Data ScienceApplicationsfor Exoplanets
- Theoretical Mechanics
- Intermediate Electricity and Magnetism
- Introduction to Quantum Mechanics
- Thermal Physics
- Special and General Relativity (Spring 2024)

OTHER WORK EXPERIENCE

Pennsylvania State University

- Penn State Dining (Spring 2021-Spring 2023)
    - Food Service Associate at Findlay and Redifer Commons on campus
    - Served customers promptly and courteously, ensuring a positive dining experience.
    - Collaborated with kitchen staff to streamline food preparation and service processes