Laksh Gupta

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Recent Bachelor of Science (Honors) from Ahmedabad University, India with a major in **Physics** and minor in **Mathematics**. I have studied White Dwarfs using data from the Hubble Space Telescope for my undergraduate thesis supervised by Professor Samyaday Choudhury (Ahmedabad University, India) and in collaboration with Dr. Annalisa Calamida (Space Telescope Science Institute, USA). I am an active member of the Astronomy & Astrophysics group at Ahmedabad University led by Professor Samyaday Choudhury.

EDUCATION

Bachelors of Science (Honours) in Physics, *Ahmedabad University* August 2020 - June 2024
GPA - 3.32/4
Relevant Coursework: Quantum Mechanics, Atomic & Nuclear Physics, Condensed Matter Physics, Plasma Physics, Nonlinear Dynamics, Computational Math, Electronics, Quantum Computing, Complex Analysis, Mathematical Statistics, Linear Algebra, Differential Equations, Multivariate Calculus, Advanced Writing

12th Grade, *La Martiniere College, Lucknow* March 2020
Score - 81.2%

10th Grade, *La Martiniere College, Lucknow* March 2018
Score - 84.8%

SKILLS

Tools	LaTeX, Excel, Tracker, TOPCAT
Astronomy	BaSTI Models (White Dwarf Cooling Models, Isochrones, Evolutionary Tracks), Optical and Near-IR Hubble Data Analysis, Color-Magnitude Diagram Analysis, Reddening Estimation
Programming Languages	• Python (NumPy, SciPy, Pandas, AstroPy, Shapely) • MATLAB • Java • R
Communication	Fluent in English and Hindi

PROJECTS

Undergraduate Thesis: Study of white dwarfs in the globular cluster NGC2808 July 2023 - June 2024
Supervisor: Professor Samyaday Choudhury *Ahmedabad University*

- Performed star counts of different evolutionary phases using photometric data of NGC2808 from the HUGS survey.
- Overplotted various BaSTI models (White Dwarf Cooling Models, Isochrones and Evolutionary Tracks) on NUV-optical Color-Magnitude Diagrams to calculate crossing times across different evolutionary phases.
- Created a Python pipeline to systematically analyse stellar populations (White Dwarf Stars, Red Giant Branch Stars, Main Sequence Turnoff Stars) for NGC2808 which is potentially applicable to other globular clusters.
- Our results indicate that the White Dwarf Sequence in NGC2808 has no bimodality up to 24 magnitude.
- This work is currently being written up for publication (Gupta, Choudhury, Calamida et al.)

Summer Reading Project: Stellar Structure & Evolution   April 2023 - July 2023
Supervisor: Professor Samyaday Choudhury   *Ahmedabad University*

- Acquired foundations in stellar structure and evolution - particularly in low-mass stars, radiative transfer and nucleosynthesis in stellar interiors, globular clusters and open clusters, compact objects like white dwarfs, stellar collisions and binary stars.

Constructing a low-cost Nuclear Magnetic Resonance Apparutus   May 2023 - October 2023
Supervisor: Professor Navinder Singh   *Physical Research Laboratory, Ahmedabad*

- Gained hands-on knowledge of Nuclear Magnetic Resonance (NMR) apparatus.
- Built an NMR apparatus using minimum circuitry and instruments for academic teaching purposes.

Profiling a Helium-Neon LASER beam
Optics Laboratory Project

- Designed the experimental apparatus to profile the He-Ne LASER beam profiling, ensuring precise alignment and calibration of optical components.
- Conducted a detailed error analysis of the experiment.

Intrinsic Magnetic Field inside Neodymium Magnets
Electromagnetism Laboratory Project

- Calculated the angular velocity (ω) of the neodymium magnets from the nail-motor experiment apparatus using Tracker software.
- Using ω measurements, the intrinsic magnetic field of the magnets was determined and a thorough error analysis was conducted.

Newton's Cradle
Classical Mechanics Laboratory Project

- Calculated the translational velocities of the bobs from the Newton's Cradle setup using Tracker software.
- After performing error analysis, translational velocity measurements were utilized to understand conservation of energy and momentum.

OTHER PROJECTS

Need Analysis for Emotional Health and Well-being of students   May 2022 - September 2023
Supervisor: Professor Shilpa Pandit   *Research Project*

- Designed a comprehensive survey to collect data on various aspects of students' mental health, ensuring inclusively and anonymity.
- Cleaned the data to remove inconsistencies and converted qualitative responses into numerical values using Python. Identified the most impactful factors contributing to students' emotional well-being.

VOLUNTEERING AND ORGANIZATIONAL ACTIVITIES

- Founded *Ramanujan Math Club* promoting student problem-solving and mathematics (August 2023 - May 2024)
- Represented Physics at the *Career Development Center* (May 2023 - May 2024)
- Volunteered at Prabhat Foundation during the COVID-19 pandemic (May 2021 - July 2021)
- Organized a *Math Fest* at the university (November 2023)
- *Peer Tutor* for Atomic & Nuclear Physics (January 2024 - May 2024) and Advanced Writing (August 2021 - December 2021)
- *Student Mitr* - Mentored 15 incoming students to acquaint them with the university's culture (August 2021 - April 2022)
- *Junior Manager* Outgoing Social Sector - AIESEC in Ahmedabad (August 2021 - October 2021)