

LAKSH GUPTA

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Master of Science in Astrophysics student at University of Bonn, Germany, through the **full scholarship** of the [Bonn-Cologne Graduate School of Physics and Astronomy](#). I 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).

EDUCATION

Master of Science in Astrophysics, [University of Bonn](#), Germany October 2025 - Present

- **Relevant Coursework:** Theoretical Astrophysics (General Relativity & Fluid Dynamics), Cosmology, Physics of Dense Stellar, X-ray Astronomy

Bachelor of Science (Honors) in Physics, [Ahmedabad University](#), India August 2020 - December 2024

- GPA - 3.32/4
- Minor in Mathematics
- **Relevant Coursework:** Quantum Mechanics, Atomic & Nuclear Physics, Condensed Matter Physics, Plasma Physics, Nonlinear Dynamics, Computational Mathematics, Quantum Computing, Complex Analysis, Mathematical Statistics, Advanced Writing

RESEARCH EXPERIENCE

Research Intern, Astronomy & Astrophysics Group June 2025 - August 2025
Supervisor: [Professor Blesson Mathew](#) [Christ University, Bengaluru, India](#)

- In collaboration with [Arun Roy](#) (Indian Institute of Astrophysics, Bengaluru) and [Shridharan Baskaran](#) (Tata Institute of Fundamental Research, Mumbai), I worked on modelling a Herbig Be star with boundary layer accretion mechanism in [RADMC3D](#) to understand forbidden [Ne II] and [Ne III].

Summer Research Fellow April 2025 - June 2025
Supervisor: [Professor Blesson Mathew](#) [Science Academies' Summer Research Fellowship](#)

- Conducted a detailed theoretical and observational review on accretion mechanisms in Herbig Ae/Be stars, identifying a switch from magnetospheric to boundary layer accretion.
- Prepared a Python pipeline to produce the largest and most complete catalogue of identified Herbig Ae/Be stars from literature.
- Initiated modeling efforts using [RADMC3D](#) to study switch in accretion mechanism in Herbig Ae/Be stars, generating SEDs of which match the inclination effects and silicate features in Herbig-like systems.

Research Intern, Astronomy & Astrophysics Group May 2024 - October 2025
Supervisor: [Professor Samyaday Choudhury](#) [Ahmedabad University](#)

- In collaboration with Dr. Annalisa Calamida to refine the star count-crossing time analysis technique developed during my undergraduate thesis.
- A **pipeline** in Python was created for the analysis. This is unique as it provides star counts and evolutionary times using five parameters (age, mass, envelope thickness, membership probability, and distance modulus), making the predictions more robust.
- This work has been published in the *The Astrophysical Journal* ([link](#)).

Undergraduate Thesis - Study of White Dwarfs in the Globular Cluster NGC2808 ([link](#)) July 2023 - May 2024
Supervisor: [Professor Samyaday Choudhury](#) [Ahmedabad University](#)

- Performed star count-crossing time analysis 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 analyze stellar populations (White Dwarf Stars, Red Giant Branch Stars, Main Sequence Turnoff Stars) of NGC2808, potentially applicable to other globular clusters.
- *Our results indicate that the White Dwarf Sequence in NGC2808 has no bimodality up to 24 magnitude in F275W.*

PUBLICATIONS

Gupta, L., Choudhury, S., Calamida, A., Johnson, C. and Nardiello, D., 2025. *An Excess of Luminous White Dwarfs in the Peculiar Galactic Globular Cluster NGC 2808.* *The Astrophysical Journal*, 994, 97

AWARDS & ACHIEVEMENTS

- Awarded the [Bonn-Cologne Graduate School of Physics and Astronomy](#) Scholarship 2025.
- Awarded the [Indian Science Academies' Summer Research Fellowship](#) 2025.
- Qualified [IIT-Joint Admission Test for Masters \(IITJAM\)](#) 2025 (top 6 percentile in the country).

RESEARCH PROJECTS

Summer Intern

May 2023 - October 2023

Supervisor: [Professor Navinder Singh](#)

[Physical Research Laboratory](#), Ahmedabad, India

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

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.
- Read *An Introduction to Modern Astrophysics* by Carroll and Ostlie and *Astrophysics for Physicists* by Arnab Rai Choudhuri.

SKILLS

Astronomy

[BaSTI](#) and [MIST](#) Models (White Dwarf Cooling Models, Isochrones, Evolutionary Tracks), Optical and Near-IR Hubble Data Analysis, Color-Magnitude Diagram Analysis, Reddening Estimation

Tools

[RADMC3D](#), [VizieR](#), [xMatch](#), [TOPCAT](#), [T_EX](#), [Tracker](#)

Programming Languages

Python (NumPy, SciPy, Pandas, Astropy, [Shapely](#), [Seaborn](#)), MATLAB, Java, R

Communication

Fluent in English (IELTS 7 band), Fluent in Hindi, German (A1 level)

ATTENDED SCHOOLS & CONFERENCES

43rd Meeting of the Astronomical Society of India, NIT Rourkela

15th - 19th February 2025

Poster titled “*Study of White Dwarfs in NGC 2808 using Near-Ultraviolet and Optical data from the Hubble Space Telescope*” ([link](#))

National School on Space Radiation

16th - 20th September 2024

[Manipal Center Natural Sciences, MAHE](#), Manipal, India

School on Solar Physics

2nd - 6th September 2024

[Physical Research Laboratory](#), Ahmedabad, India

LEADERSHIP AND VOLUNTEERING ACTIVITIES

- Mentored a summer intern at Ahmedabad University (May 2024 - June 2024)
- *Peer Tutor* for PHY315 - Atomic & Nuclear Physics (January 2024 - May 2024) and COM102 - Advanced Writing (August 2021 - December 2021)
- Organized a *Math Fest* at Ahmedabad University (November 2023)
- Founded *Ramanujan Math Club* promoting student problem-solving and mathematics at Ahmedabad University (August 2023 - May 2024)
- Represented Physics at Ahmedabad University's *Career Development Centre* (May 2023 - May 2024)
- *Student Mitr* - Mentored 15 incoming students to acquaint them with Ahmedabad University's culture (August 2021 - April 2022)
- *Junior Manager* Outgoing Social Sector - Association Internationale des Étudiants en Sciences Économiques et Commerciales (*AIESEC*) in Ahmedabad (August 2021 - October 2021)
- Volunteered at *Prabhat Foundation* during the COVID-19 pandemic (May 2021 - July 2021)