

Abhay Kumar Prusty

Fourth Year Undergrad, BS-MS

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Education

- Oct 2022 – Present **BS-MS Dual Degree in Physics (Minor in Computer Science)**, *Indian Institute of Science Education and Research (IISER) Kolkata*, West Bengal, India, 741246.
8th semester, Department of Physics
Key Courses: Advanced Quantum Mechanics, General Physical Chemistry, Electrostatics and Magnetism, Earth System and Processes, Mathematical Methods, Biological Science, Computer Science, Statistical Mechanics, Thermal Physics, Introduction to Astrophysics, General Theory Of Relativity and Cosmology, Space Astronomy Laboratory
- 2020 – 2021 **Higher Secondary (12th Grade)**, *Jupiter Higher Secondary School*, Bhubaneswar, Odisha.
90.5% (Council of Higher Secondary Education, Odisha)
- 2018 – 2019 **Secondary School (10th Grade)**, *Bhagabati Nodal High School*, Belarpur, Odisha.
84.5% (Board of Secondary Education, Odisha)

Research Project

- Jun 2025 – Jul 2025 **Research Intern**, *Tata Institute of Fundamental Research (TIFR)*, Colaba, Mumbai, India.
Advisor: Dr. Priyanka Chaturvedi
Reduced and analysed observational data from the HFOSC spectrograph at the Hanle telescope for two M-dwarf stars. Contributed to an ongoing research programme on stellar flares in active stars (J16111534).
[Link to my Report.](#)
- Oct 2024 – Jul 2025 **Research Project (Remote)**, *INAF – National Institute for Astrophysics*, Torino, Italy.
Advisor: Dr. Shourya Khanna
Contributed to the development of *SpiralMap*, a Python package documenting major Milky Way spiral-arm models. Integrated maser, radio, electron-density, and spiral-arm models including Reid (2019), Taylor & Cordes (1992), Levine, Drimmel, Hou et al. (2009), and Poggio. The package is publicly available on GitHub Repository.
- Sep 2024 – Present **Research Project**, *Indian Institute of Science Education and Research (IISER) Kolkata*, Kolkata, India.
Advisor: Mr. Raghunath Ghara
Working on the 21-cm signal from the Dark Ages and its importance to cosmology, focusing on theoretical and observational implications for early-Universe structure formation, cosmic neutral hydrogen evolution, and baryon-dark matter interactions.
- May 2024 – Jul 2024 **Research Intern**, *Indian Institute of Technology Bhilai*, Bhilai, India.
Advisor: Dr. Mahavir Sharma
Analysed Gaia DR3 data for ~5.59 million stars to study Milky Way formation history. Focused on metal-poor stars, orbital dynamics, kinematics, and metallicity to distinguish disc and halo populations.
[Link to my Report.](#)

Work Experience

- Poster Presentation: Presented a Poster On DPS Day 2026 at Iiser Kolkata On my recent work 'Modeling the 21CM for the Early Universe'. [Link to my Poster.](#)
- Citizen Scientist (Zooniverse): Analysed ASAS-SN variable star light curves and participated in supernova detection through Galaxy Zoo.

- Space Blogger (Infinity Cosmos): Authored articles on auroras, Aditya-L1, Falcon 9 launches, and space science developments.
- MTIAUA Workshop: Completed training on citizen science, lunar exploration, and galaxy formation with JWST.
- Astroflux Member: Active participant in student-led astronomy discussions.
- Office Bearer: Treasurer, IISER Kolkata Kabaddi Club (2023–24).

Publications

- Prusty, A. K. & Khanna, S., *SpiralMap*: A Python package featuring major Milky Way spiral-arm models. Submitted to *Journal of Open Source Software* (2025). Preprint available on arXiv.

Computational Skills

Languages	Python, HTML, C (basic), \LaTeX , ADQL, Astropy
Tools	Astrometrica, SAO DS9
Platforms	Linux, Windows, macOS

Professional Development

- Teaching Assistant for the course PH1201: Electricity and Magnetism.
- Chief Coordinator, Astronomy Department, ScienceOverse: Led a team of 7–8 members to organise scientific webinars, discussions, and quizzes.
- Editor-in-Chief: Published the inaugural issue of *The Scientifical*, a science outreach magazine.

Achievements and Certifications

Dec 2023	Start-Up Meet, IIT Kharagpur
Jul 2023	Planetary Defender in DART
Nov 2017	National Means Cum Merit Scholarship (NMMS)