

Abhay Kumar Prusty

Fourth-Year Undergrad , BS-MS

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Education

- Oct 2022 – **BS–MS Dual Degree in Physics (Minor in Computer Science)**, *Indian Institute of Science Education and Research (IISER) Kolkata*, West Bengal, India.
Present 8th semester, Department of Physics
SGPA: 8.21 / 10
CGPA: 7.55 / 10
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
- 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 – **Research Intern**, *Tata Institute of Fundamental Research (TIFR)*, Colaba, Mumbai, India.
Jul 2025 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 – **Research Project (Remote)**, *INAF – National Institute for Astrophysics*, Torino, Italy.
Jul 2025 Advisor: 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 – **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 – **Research Intern**, *Indian Institute of Technology Bhilai*, Bhilai, India.
Jul 2024 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

- 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), L^AT_EX, ADQL, Astropy

Tools Astrometrica

Platforms Linux, Windows, macOS

Professional Development

- 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 Scientificial*, 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)