

Abhay Kumar Prusty

Third-year Undergrad , BS-MS

Kendrapara , Odisha , India

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Education

Integrated Bachelors & Masters in Physics (Minor in CS)

WB , India

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH - KOLKATA

OCT 2022-Present

6th semester, Department of Physics

Semester Grade Point Average (SGPA): **8.21** (from a maximum of 10)

Cumulative Grade Point Average (CGPA): **7.55** (from a maximum of 10)

Key-Courses: Introduction to QM , General physical Chemistry, Electrostatic and Magnetism, Earth System and Processes, Mathematical methods, Biological Science, Computer Science.

12thGrade - Secondary School

JUPITER HIGHER SECONDARY SCHOOL, Bhubaneswar, ODISHA

2020-21

90.5% in The Council Of Higher Secondary Education , ODISHA

10thGrade - High School

BHAGABATI NODAL HIGH SCHOOL , BELARPUR

2018-19

84.5% in Odisha Board Of Secondary Education , ODISHA

Research Project

Project , INAF - National Institute for Astrophysics

Torino, Italy

ADVISORS: Shourya Khanna

Oct 2024 - Present
(Remotely)

Presently contributing to the development of a Python package documenting various **spiral arm models** for Galactic structure analysis. This project integrates models for masers, radio data, electron density, and spiral arms, including those by Reid (2019), Taylor & Cordes (1992), Levine, Drimmel, Hou et al. (2009), Poggio, and Georgelin & Georgelin (1976). The package is intended for public release on GitHub upon completion

Project , IISER KOLKATA

Kolkata , India

ADVISORS: Mr. Raghunath Ghara

Sept 2024 - Present

Currently engaged in a research project on the **21-cm signal from the Dark Ages and it's importance to cosmology**, This work focuses on the theoretical and observational implications of the 21-cm line for understanding the early Universe's structure formation, the evolution of cosmic neutral hydrogen, and the interplay between baryonic matter and dark matter. The study emphasizes the signal's significance in probing the physics of the Dark Ages, the Epoch of Reionization, and its potential to explore the fundamental questions in cosmology.

Research Intern , IIT BHILAI

Bhilai , India

ADVISORS: Dr. Mahavir sharma

May 2024 - July 2024

During my IIT Bhilai internship, I analyzed Gaia DR3 data for ~5.59 million stars to study the Milky Way's formation. Focusing on metal-poor stars, I examined orbits, kinematics, and metallicity, distinguishing disc and halo stars. Metal-rich stars showed high angular momentum, while metal-poor stars had random orbits, reflecting early galaxy conditions and evolution Link to my [report](#)

Work Experience

- **Citizen Scientist (Zooniverse):** Analyzed light curves of variable stars (ASAS-SN) and explored supernovae detection (Galaxy Zoo).
- **Space Blogger (Infinity Cosmos):** Authored blogs on space science, covering topics like auroras, Aditya-L1, and Falcon 9 updates.
- **MTIAUA Workshop:** Completed a workshop on citizen science, lunar exploration, and galaxy formation with JWST.
- **Astroflux Member:** Participates in a student community discussing space-related topics in regular sessions.
- **Office bearers :** Was treasurer of IISER Kolkata Kabaddi Club (2023-24)

Publication

- SpiralMap: A Python library/package featuring major Milky Way spiral arm models (Prusty & Khanna, submitted for 2025 to JOSS). Preprint available at [arxiv](https://arxiv.org/abs/2408.12345).

Computational Skills

Languages : Python, Html, C(basic), LaTeX, Astrometrica, ADQL(Astronomical SQL), Astropy.

Devices : Windows, Linux

Professional Development

- **Chief Coordinator, Astronomy Department, ScienceOverse:** Led a team of 7-8 members to organize scientific webinars, discussions, and quizzes, including sessions like *Interstellar Habitability: Insights into Exoplanetary Life Potential* by Mr. Priyash Kumar Mistry and *Designing Rovers for Planetary Exploration* by Mr. Sarth Mohan.
- **Editor-in-Chief :** Published the inaugural edition of the magazine **The Scientifical**, showcasing scientific insights and discoveries.

Achievements and Certifications

- **Start-Up Meet 2023** (Dec 2023)
at Indian Institute of Technology, Kharagpur
- **Planetary Defender in DART** (July 2023)
- **National Means Cum Merit Scholarship (NMMS)** (Nov 2017)