Arnab Biswas

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Personal webpage: https://the-cosmic-connection.github.io/the-cosmic-connection/#

Research Interests: Astrophysics and Cosmology

Projects

Planetary Motion and Few-Body Problems — Sep 2024 - Nov 2024

- Project guide: Dr. Colin Benjamin (https://www.niser.ac.in/profile/colin)

- Brief description: This project was done as a part of our Computation Physics course(P346). The project focussed on learning and implenting python simulations to visualise planetary orbits under both Newtonian and general relativistic gravitational fields, motions in a three-body system (e.g. motion around Lagrange points) etc.

Study of a Mira Variable Star in the Field of NGC 559 — May 2024 - July 2024

- Project guide: Dr. Yogesh Chandra Joshi (https://www.aries.res.in/yogesh/)

- Brief description: In this project, I analysed the time-series photometric data of a Mira variable star in the field of an intermediate-age open cluster NGC 559, taken with various telescopes in different bands. The analysis revealed the some important stellar parameters of the star, which also confirmed the star's classification as a Mira variable.

Estimating the Precession of Mercury's Orbit — May 2023 - July 2023

- Project guide: Dr. Nishikanta Khandai (https://niser.irins.org/profile/241972)

- Brief description: This was a reading project. I learned how we can predict the Keplerian orbits depending upon the initial conditions. Later, I solved the relativistic Binet equation using perturbative method that counts for the precession of perihilion of planetary orbits as predicted by Einstein's general theory of relativity. This project has helped me gain deep insights about planetary orbits.

Skills

- Programming: Python (especially astropy, scipy, numpy, matplotlib, VPython and openCV modules), Wolfram (basics)
- Tools: LaTeX, HTML
- Photometry and light curve analysis

– Setting up and operating 6" and 8" Newtonian telescopes and Celestron's CPC DELUXE 1100 HD Computerized Telescope

Conferences and Workshops

Attended the 17th Radio Astronomy Winter School (2024) December 2024
- Jointly organised by IUCAA and NCRA-TIFR.

Awards and Achievements

IASc Summer Research Fellow 2024

DAE-DISHA scholar

Qualified the International Astronomy and Astrophysics Competetion, 2023

Winner of 'Integration+C' March 2023
-A mathematics competetion held in NISER's intercollege fest

Second runner-up in 'Antariksh' March 2023
-An astronomy quiz held in NISER's intercollege fest

Education

CGPA till 5th semester: 8.85 August 2022 - Present
National Institute of Science Education and Research, Bhubaneswar
Relevant Coursework: Classical Mechanics, Quantum Mechanics, Statistical Mechanics, Electromagnetism, Linear optics, Mathematical Methods, Computational Physics.

AIR 389, Percentile: 97%
National Entrance Screening Test (NEST) 2022

93% marks in WBCHSE 2022 (Class 12 board exam)
95.57% marks in WBBSE 2020 (Class 10 board exam) (Block Topper)
Karimpur Jagannath High School (H.S.) 2014 - 2022

Other Experiences

– The representative of NISER Astronomy Club's Telescope Training Committee.
(August 2023 - Present)

– Actively associated with NISER Astronomy Club's 'Experiments' group that has been doing spectrophotometry to determine features of a binary star system. The 'Experiments' group has conducted an experiment to determine the orbital periods of the Galilean moons of Jupiter in the past.

– An active member of Vikiran, NISER's physics club.

– Quiz master of 'Scientia', a physics quiz organised by Vikiran for NISER's student community.

– Demonstrated a simulation of 'gravitational lensing' using handy items to school students on NISER open day, 2023.

Hobbies

Stargazing, reading books, playing ukulele and writing poems.