

SANCHARI SEN

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Education

ST. XAVIER'S COLLEGE (AUTONOMOUS), KOLKATA (September, 2022 – Present)
Pursuing Bachelors of Science (B.Sc) with Honours in Physics along with Mathematics and Computer Science as my general elective.

ST. STEPHEN'S SCHOOL, DUM DUM (2007-2022)

- Passed Indian School Certificate Examination (ISC) in 2022 with 98.25 % marks and All India Rank 7th.
- Passed Indian Certificate of Secondary Education Examination (ICSE) in 2020 with 96.24 % marks.

Exposure & Experience

Bose Institute, Kolkata Kolkata, India
Undergraduate student researcher July 2023-present
Supervisor: Prof. Dhruba Gupta

- *Monte-Carlo simulation of breakup of light unstable nuclei in nuclear astrophysics*
- *Developing a basic computational system for studying kinematics of nuclear reactions in Python* ([here](#))
- *Studying various reaction rates for nucleosynthesis using R-Matrix formulation*

St. Xavier's College (Autonomous), Kolkata Kolkata, India
Undergraduate Researcher at the Xaverian Astronomical Society December, 2023-present
Supervisor: Dr. Suparna Roychowdhury

- *Prediction of sunspots using Machine learning*: using supervised machine learning algorithms to analyze past sunspot data to develop a code that will predict the number of sunspots in the next 11 year cycle.
- *Constraining cosmological parameters using Bayesian Inference* ([here](#)): understanding Newtonian Cosmology and using it along with Bayesian methods to constrain certain parameters of the standard cosmological model
-a portion has been covered by our group, the rest has been taken up by an upcoming group to continue.

Indian Institute of Technology, Indore Indore, India
Internship 1-30 June, 2023
Supervisor: Dr. Abhirup Datta

- Foreground removal of 21 cm cosmological signals using GPR ([here](#))
- Worked on computational methods in Astronomy using Python and got exposed to basics of Machine Learning.

Indian Institute of Astrophysics Remote
Virtual Summer School ([here](#)) 1-4 June, 2023

- A short course on basics of introductory Astrophysics.

Young Scientists Journal ([here](#)) Remote (September, 2023- present)
• Junior editor of the Department of Physics.

- The Journal of Young Physicists** ([here](#)) Remote (August, 2023- present)
- Content editor for review as well as original articles based on computational methods, astrophysics and subatomic physics.
- UC Berkeley** Remote
- REYES Summer Program** ([here](#)) June, 2023- February, 2024
- A series of lectures on current research in various areas of sciences.
 - A introductory course on using Python for research in STEM.
- University of Sydney** Remote
- Data Driven Astronomy** ([here](#)) November, 2023- January, 2024
- An online course on the basics of data handling in Astrophysics, using Python and SQL.

Undergraduate Dissertation

Supervisors- Dr. Suparna Roychowdhury & Prof. Dhruba Gupta

Topic- Stellar Evolution & Nucleosynthesis: Main Sequence and Post Main Sequence ([here](#))

Area of Interest- Nuclear Astrophysics, Stellar Astrophysics

As a part of this dissertation, we have studied the stellar evolution, with focus on the main sequence and post main sequence stars, through nucleosynthesis- we have shown how the different nuclear reactions form the heart of the evolution, necessarily affecting all the variable factors like mass, temperature, luminosity, etc. Following this, we have studied the cross sections of these reactions, which dominantly influence the elemental abundances. We have also computed a stellar model and used data from surveys to develop HR diagram and CMD and fit isochrones to evaluate age of clusters.

Honours & Presentations

- » **"Emergence and Consciousness"** ([here](#)) (Co-author: Arpan Dey)
- Presented the paper in Spectrum, 2023, a departmental fest in St.Xavier's College (Autonomous), Kolkata.
 - Published in *The Journal of Young Physicists*, May 2023
- » **"On the Black Hole Information Paradox"** ([here](#)) (Co-author: Arpan Dey)
- Presented the paper at Meera Memorial Paper Reading Competition, St.Stephen's College, Delhi.
 - Published in *The Journal of Young Physicists*, May 2023
- » Delivered a talk on **Lunar Phenomena**, as a part of National Science Day, 2023 in my institution.
- » **Bronze Honour** at International Astronomy and Astrophysics Competition (IAAC), 2023. ([here](#)).
- » **Second(2nd) Position** at the paper presentation at Spectrum, St.Xavier's College (Autonomous) Kolkata on Emergence and Consciousness.
- » Presented a paper on **The Fundamental Domain of the Modular Group** at Spectrum, 2025, St.Xavier's College (Autonomous), Kolkata.

Skills

- Computational:
 - **Python-** Data science and Machine learning; using Scikit-learn, GPy, Astropy, Lightkurve, PyMC.
 - Softwares- **Geant4, Nptools, AZURE2** Astrometrica
 - **C, CERN-ROOT**, Java, Gnuplot, LTSpice, SQL
- Languages- English, Bengali, Hindi

- Scientific writing and literature review

Extracurricular Activities

- Secretary of the Xaverian Astronomical Society (XAS), St.Xavier's College (Autonomous), Kolkata (2024-25).
- Student mentor to junior undergraduate students, working on astronomy projects under XAS (2024-25)
- Leading editorial team member of Horizon, the annual magazine of the Department of Physics, St.Xavier's College (Autonomous), Kolkata(2023-25).
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- Core Committee Member (CCM) for OVerall Management at Spectrum 2025, the annual fest of the Department of Physics, St. Xavier's College (Autonomous), Kolkata.
- Student mentor at Astronomy Summer School for high school students, organised by XAS at St. Xavier's College, Kolkata (2023 & 2024).
- Student Member at the American Physical Society (APS)
- Active researcher and content writer at XAS; actively involved in organising numerous seminars and webinars (2022-24).
- Student Volunteer at National Service Scheme (NSS)- organized a campaign involving visit to a girls' orphanage and encouraging them on scientific thinking and opting for a career in science fearlessly through posters and presentation.
- Student volunteer at Dolphin NGO - visit to a medical camp to treat pilgrims with first-aid, basic medicines and water supply for a period of two weeks.
- Member of the Photography team at Fine Arts Society, St.Xavier's College (Autonomous) , Kolkata.
- Core Committee Member (CCM) for Hospitality at Spectrum 2024, the annual fest of the Department of Physics, St. Xavier's College (Autonomous), Kolkata.

Interests

- Writing
- Photography
- Reading
- Traveling