SREETAMA DAS CHOUDHURY

Email: d.sreetama@iitg.ac.in, sreetamadc1995@gmail.com **Phone**: 7044737617 **Website**: https://titir-pakhi1234.github.io/Portfolio/

ACADEMIC DETAILS

Examination	Board/university	Percentage/CGPA	Division
M.Sc (2019)	St Xaviers College(Calcutta University)	76.5	First
B.Sc (2017)	Calcutta University	63	First
STD XII (2014)	CBSE(Central Board for Secondary Education)	90.6	First
STD X (2012)	CBSE(Central Board for Secondary Education)	9.8	First

PRESENT POSITION: Research Scholar, Department of Physics, Indian Institute of Technology, Guwahati
Supervisor: Prof. Santabrata Das

WORK EXPERIENCE

PhD Student: Indian Institute of Technology Guwahati, Guwahati **27/08/2021-present**
Working under the supervision of Prof. Santabrata Das on the following topic:

1. Revisiting Disc-Jet Coupling in Black Hole X-ray Binaries: On the Nature of Disc Dynamics and Jet Velocity
2. Unified Configuration of Disc-Jet Coupling in BH-XRBs
3. Probing the Origin of HFQPOs in Structured Variability Classes (ω, κ, ν, μ, τ and ρ) in GRS 1915+105: Insights from AstroSat, RXTE and HXMT
4. First XSPECT/XPoSat National Workshop: Importance and Science Outcomes
5. AstroSat Observations of Black Hole Binaries: Unification of Accretion Disk Configuration
6. Complex Modeling of LFQPOs in Swift J1727.8-1613 and its Spectral Properties
7. XSPECT/XPoSat View of Stellar-Mass Black Holes - First Results

Publications

1. **Das Choudhury, S.**, Bhuvana, G. R., Das, S., & Nandi, A. (2025). *Revisiting disc–jet coupling in black hole X-ray binaries: on the nature of disc dynamics and jet velocity. Monthly Notices of the Royal Astronomical Society*, **541**(4), 2934–2954. https://doi.org/10.1093/mnras/staf1107

Project Student: St. Xaviers College, Kolkata, Kolkata (India) **01/08/2019–07/2021**
Research projects under Dr Suparna Roychowdhury:

a) Analyzed stationary fluid solutions in black hole accretion disks using pseudo-Newtonian potentials (e.g., Paczyński-Wiita, Artemova). Generated Mach number vs. distance plots to examine critical point instability and derived the Banibrata vector potential to study fluid solutions and critical points near a Kerr black hole.

b) Using initial conditions from NASA's JPL Small-Body Database, we simulated the Sun-Jupiter-asteroid system in the elliptically restricted three-body problem, placing asteroids in Kirkwood gaps. We analyzed the evolution of eccentricity and semi-major axis over time, assessing chaotic dynamics through Poincaré maps with Rebound integrators.

Project Student: St. Xaviers College, Kolkata (India) **07/2018–03/2019**
Did my Masters project on X-Ray binaries,Pulsars, emission procedeur of X- Rays in Vela-X1 and Vela Pulsar under Dr. Suparna Roychowdhury in St.Xaviers College, Kolkata.
Project Student: National Centre for Radio Astrophysics, Pune (India) **05/2018–07/2018**
Did a project on pulsar and strong pulse detection and its behaviour with time and frequency, in NCRA, Pune under Dr. Bhaswati Bhattacharyya.
Project Student: InterUniversity Centre For Astronomy and Astrophysics, Pune (India) **12/2017–12/2017**
Did a project on detection of gravitational waves in IUCAA, Pune under Prof. Somak Raychowdhury.

TEACHING ASSISTANCE

Teaching Assistant: Indian Institute of Technology Guwahati, Guwahati **01/09/2022-present**

a) PH511: General Physics Lab
b) PH102: Electrostatics and Magnetostatics
c) PH101: Classical Mechanics, Special Theory of Relativity, Quantum Mechanics

Guest Lecturer: Cotton University, Guwahati **01/02/2023-present**

a) PHY 501 C11: Solving problems based in Quantum Mechanics using Scilab.
b) PHY 602 C14: Solving problems based on Statistical Mechanics using Scilab.
c) PHY 602 C14: Solving problems based on Statistical Mechanics using Scilab.
d) PHY 301 C5: Introduction to Numerical Computation software Scilab, Cotton University.
e) PHY 401 : Introduction to Numerical Computation software Scilab, Cotton University.
f) PHY 703C: Mathematical Physics: Fourier Transform

Guest Lecturer: Jagiroad College, Jagiroad **01/12/2021-01/12/2022**

a) Computation Lab: Learning Numerical methods using Python language.
b) Quantum Mechanics: Linear Harmonic Oscillators.

SEMINARS/CONFERENCES ATTENDED

1. Attended “XPoSat Science Meet: Performance Appraisal, Data Release and Guest Observation Opportunity” organised by ISRO in 2025.
2. Attended “National Workshop on Hands-on Data Analysis of XSPECT on-board XpoSat” organised by ISRO in 2025.
3. Organised workshop on “Solar Flare Science With ADITYA-L1” at IIT Guwahati
4. REcent Trends in the study of Compact Objects (RETCO-VI), organised by IIT Indore.
5. North East Meet of Astronomers, organised by Tejpur University nd IUCAA.
6. COSPAR Scientific Assembly, 2024, Busan, Sout Korea.
7. 10th International Conference on Gravitation and Cosmology (ICGC), organised by IIT Guwahati, Guwahati.
8. REcent Trends in the study of Compact Objects (RETCO-V), organised by IIA in Kodailkanal Solar Observatory (KSO), Kodaikanal.
9. Young Astronomers Meet (YAM) 2022, Organised by ARIES, Nainital.
10. Attended “International Workshop on Coarse Geometry” at St Xaviers College, Kolkata.
11. Attended a ‘Camps for Hands on Expirience in Radio Astronomy (CHERA)’ organised by RRI & IIA, Bangalore.
12. Attended “Radio Astronomy Workshop (RAWA)” in St Xaviers college, Kolkata.
13. Participated in “Precision 2018” physics fest in Presidency University and gave a talk on the project that was done in NCRA under Dr. Bhaswati Bhattacharyya.
14. Attended a pre masters workshop at Bangabasi College, Kolkata in 2017 after passing Bachelors Degree in physics.

SKILLS

Operating System: Windows, Linux
Programming Language: Python, Matlab, C++, C, Octave, Linux Shell scripting
Plotting Software: Gnuplot
Analysis Software: PSRCHIVE, PRESTO, HEASOFT, XSELECT, XIMAGE, SALSA J, HXMTDAS, LAXPCSoftware
Others: Latex, Lyx, Microsoft Office(Word, Powerpoint, Excel), Libre Office(Writer, Presentation, Excel), HTML, XML, SQL

REWARDS AND RECOGNITION

1. Recieved prestigious Prime Minister Research Fellowship (PMRF) in July 2021, in Direct Entry channel in Cycle 7.
2. Cleared Graduate Aptitude Test in Engineering (GATE) 2021, with All India Rank, 85 and GATE score, 730.
3. Cleared National Eligibility Test (NET), Lecturership (LS) with All India Rank 57 in 2021.
4. 1st Prize for presenting Msc project at *National Seminar on Applications of Statistics in Natural Sciences* (IUCAA Centre for Astronomy Development & St. Xavier's College, Kolkata, Dec 2019).
5. 1st position in District Student Youth Science Fair 2012, poster competetion, HS level
6. 2n.d position in West Bengal State Level Student Youth Science fair 2012, H.S group, poster competetion.

REFERRENCES

1. Prof. Santabrata Das (email: sbdas@iitg.ac.in)
2. Dr. Anuj Nandi (email: anuj@ursc.gov.in)
3. Dr. Suparna Roychowchury (email: suparna.roychowdhury@gmail.com)
4. Dr. Bhaswati Bhattacharyya (email: bhaswati@ncra.tifr.res.in)

Declaration: **I hereby declare that all the statements made by me are correct and true at the best of my knowledge.**