

# Samriddha Ganguly

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## Bio-Sketch

I am a fourth-year BS–MS Dual Degree student in Physics at the Indian Institute of Science Education and Research (IISER) Bhopal, with research interests in **theoretical condensed matter physics**. I am trying to focus on **topological superconductivity, proximity-induced superconducting phases**, and **Andreev reflection** in hybrid quantum systems.

I am particularly interested in how **superconducting correlations emerge at interfaces**, especially in heterostructures with **strong spin-orbit coupling, magnetism, or flat-band physics**. My research aims to understand the microscopic mechanisms behind **Majorana zero modes**, their transport signatures, and their potential in **quantum device architectures**.

More broadly, I study **quantum materials and engineered heterostructures** where topology, symmetry, and interactions give rise to unconventional pairing and novel quasiparticles, combining **analytical methods, numerical techniques, and experimentally relevant predictions**.

## Education

<b>BS-MS IISER Bhopal</b> , Physics	Dec 2022 – Present
<ul style="list-style-type: none"> <li>GPA: 3.8/4.0</li> <li><b>Relevant Coursework:</b> Introduction to Quantum Physics, Quantum Mechanics I, Advanced Quantum Mechanics, Statistical Mechanics, Numerical Methods in Programming, Wave and Optics, Electromagnetism, Classical Mechanics, General Properties of Matter, Physics through Computational Thinking, Classical Thermodynamics, Basic Electronics, Linear Algebra, Complex Variables, Probability and Statistics, Multivariable Calculus, Groups and Symmetry, Real Analysis, Mathematical Methods for Physicists</li> </ul>	
<b>BS-MS St. Xavier's Institution</b> , Higher Secondary	May 2020 – Apr 2022
<ul style="list-style-type: none"> <li>98.75%</li> </ul>	
<b>BS-MS St. Xavier's Institution</b> , Secondary	June 2011 – Apr 2020
<ul style="list-style-type: none"> <li>98%</li> </ul>	

## Publications

### 1. Decoherence of chiral magnon edge modes in a topological bosonic Chern insulator,

**Samriddha Ganguly**,

*Journal of Physics: Condensed Matter*, **38**, 075801 (2026).

Focus Issue on Topological Physics: From Fundamentals to Applications.

doi: [10.1088/1361-648X/ae44df](https://doi.org/10.1088/1361-648X/ae44df) [🔗](#).

### 2. A Data-Driven Approach to Leak Identification and Severity Analysis in Pipelines Using Acoustic Sensing and Deep Learning,

Mayukh Biswas; Aditya Narayan; Debaudh Ghosh; **Samriddha Ganguly**; Raj Rakshit; Chirabrata Bhaumik,

*IEEE Sensors Letters*, **10**(1) (2025).

Publisher: IEEE.

doi: [10.1109/LSENS.2025.3638602](https://doi.org/10.1109/LSENS.2025.3638602) [🔗](#).

## Experience

<b>Research Intern</b> <a href="#">🔗</a> , Indian Institute of Science Education and Research, Bhopal	Bhopal, India Jun 2025 – Oct 2025
<ul style="list-style-type: none"> <li>Studying about classification of topological quantum matter with symmetries under Dr. Nirmal Ganguli.</li> <li>Specifically, I carried out a comprehensive theoretical analysis of the symmetry-protected <b>topological Dirac nodal line (DNL) magnonic phase</b> in layered honeycomb collinear antiferromagnets and how it is affected by Interlayer Spin Canting Interactions.</li> <li>Work related to this work has been accepted for Poster Presentation in <a href="#">12th National Conference on Recent Trends in Material Science and Technology, IIST Trivandrum</a> <a href="#">🔗</a> and I have also</li> </ul>	

presented a poster at the [International Conference on Quantum Materials and Emerging Concepts \(QMEC\) 2025](#). We are further working on a paper submission.

**TCS Research and Innovation Fellow** [TCS Innovation Labs, IIT Kharagpur Research Park.](#)

- I worked in the **Acoustic and Quantum Sensing Lab**. This experience helped me gain some valuable industrial R & D exposure on optimizing workings of Mills and Pipelines.
- For reference regarding my work please contact my guide at TCS Research, **Mr. Raj Rakshit** via phone (+919051658142) or email ([raj.rakshit@tcs.com](mailto:raj.rakshit@tcs.com) / [rajrakshit619@gmail.com](mailto:rajrakshit619@gmail.com))

Kolkata, India  
May 2025 – Jul 2025

**INSA-IASc-NASI Summer Research Fellow** [Indian Institute of Science](#)

- Selected in prestigious Summer Research Fellowship program to gain research experience working under **Dr. Arvind Ayyer, Department of Mathematics, IISc, Bengaluru.**
- This project aims to give a theoretical background to **Markov Processes** with particular emphasis on using MCMC to simulate the Ising Model in 1-D.

Bangalore, India  
May 2024 – Jul 2024

**RAWS Winter Scholar** [IUCAA-NCRA TIFR](#)

- Attended the **Radio Astronomy Winter School (RAWS) 2023** from December 12 to December 22 organized by NCRA-TIFR and IUCAA, Pune. Learned about the **basics of Radio Astronomy**, with **Hands-on Experiments** using Radio Observation Equipments.

Pune, India  
Dec 2023 – Dec 2023

**UC Berkeley REYES Research Fellow** [Temple University](#)

- Selected to participate in the **UC Berkeley REYES Program** where I worked under the guidance of **Dr. Martha Constantinou from Dept. of Physics, Temple University.**
- I worked on the project titled "**Internal structure of hadrons from numerical simulations of Quantum Chromodynamics**".

Remote  
Jul 2024 – Aug 2024

## Awards

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2025	<b>TCS Research and Innovation Fellowship:</b> <a href="#">TCS Innovation Labs, IIT Kharagpur Research Park.</a>	50000/-
2023	<b>CNR Rao Education Foundation Prize:</b> <a href="#">CNR Rao Education Foundation</a> <i>Awarded by the Hon'ble Director of IISER Bhopal for having the Highest CPI in the First Semester of First Year of degree.</i>	5000/-
2022	<b>Academic Excellence in Higher Secondary Examination:</b> <a href="#">West Bengal State Education Board</a> <i>Received award from Hon'ble Chief Minister of West Bengal for achieving AIR 5 in HS Examination.</i>	N/A
2022	<b>DST INSPIRE FELLOW</b>	300,000/-
2020	<b>JBNSTS Junior Fellow:</b> <a href="#">JBNSTS</a>	40000/-
2020	<b>INSA-IASc-NASI Summer Research Fellowship:</b> <a href="#">Indian Institute of Science</a>	25000/-

## Initiatives and Projects

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**open\_board: An Interdisciplinary Knowledge-Sharing Initiative**

Co-Founder & Lead Developer

- Conceptualized and developed a peer-to-peer platform for students to present projects and research to a non-specialist, interdisciplinary audience in fun and engaging live sessions.

[Website](#) | [Repo](#)

**A Hitchhiker's Guide to Physics @ IISERB**

Lead Developer

- Built a comprehensive website for the physics department to centralize academic resources, featuring course guides and timetable and a platform for sharing notes and a secure, domain-restricted (@iiserb.ac.in) forum for discussions.

[Website](#) | [Repo](#)

## Skills

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**Programming and Software:** Python • MATLAB • Mathematica • C • LaTeX • C++ • Java • Linux •  
**Languages:** Bengali • English • Hindi • Spanish (Elementary) • German (Elementary)

## Positions of Responsibility:

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<b>Secretary</b> , Science Council, IISER Bhopal	2024-2025
<b>Peer Counselor</b> , Counselling Cell, IISER Bhopal	2023-2024
<b>Departmental Representative</b> , Dept. of Mathematics, IISER Bhopal <a href="#">↗</a>	2023-2024
<b>Math Circle Volunteer</b> , Math Circle, IISER Bhopal. <a href="#">↗</a>	2023-2024
<b>Student Mentor</b> , Student Development Council, IISER Bhopal <a href="#">↗</a>	2023-Pres.
<b>Quiz Club Core Committee Member</b>	2023-Pres.
<b>Movie Club Core Committee Member</b> <a href="#">↗</a>	2023-2024
<b>Enthuzia '23 (Annual Cultural Fest) Social Media Associate</b> <a href="#">↗</a>	2023-2024