

Sabarno Saha

Curriculum Vitae

* 28 October 2004

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TheInvisibleFoe

Profile

I am a physics major, minoring in mathematics at the Indian Institute of Science Education and Research, Kolkata. Currently, I am currently reading about the driven dissipative Jaynes-Cummings Model used in Open Quantum Systems. I also like reading about random topics that I find interesting, like how microfluidics are used to create logic gates.

Education

- 2022 – Present **Integrated BS-MS** , *Indian Institute of Science Education and Research* , Kolkata, Current CGPA: 9.14/10
- 2022 **AISSCE**, *Kalyani Central Model School*, Kalyani, 87.5 %
- 2020 **ICSE**, *Don Bosco School*, Bandel, 95 %

Research Interests

Open Quantum Systems, Stochastic Thermodynamics, Stochastic Resetting, Statistical Mechanics, Active Matter

Projects

- Dec 2024 - Present **Correlations of Brownian particles in Quasi-2D suspensions**,
Supervisor: Dr. Rajesh Singh, IIT Madras
- Learning Fluid mechanics and Microhydrodynamics.
 - Studying the transverse and longitudinal correlations of brownian particles in Quasi-2D fluids under a confined geometry with stokes-flow conditions.
- May - Dec 2024 **Bayesian Model Selection of Single Particle Tracking Models**,
Supervisor: Dr. Rajesh Singh, IIT Madras
- Learned about Stochastic Thermodynamics and Particle tracking models.
 - Worked on Bayesian model selection of some models, (OUP, AOUP, High friction generalization of Kramers' equation with measurement noise)
 - Worked on 1-D Run and Tumble Particles and their parameter estimation.

Coursework

- Current courses Basic Statistical Mechanics, Intermediate Electricity Magnetism, Advanced Quantum Mechanics, Electronics Laboratory, Computational Physics Lab, Statistics I, Topology
- Completed Courses Mechanics I, Electricity and Magnetism, Analysis I & II, Linear Algebra, Biophysics, Waves and Optics, Special Relativity, Mathematical Methods I & II, Introduction to Python, Physics Laboratory (General Physics, Optics, Modern Physics), Probability - I, Thermal Physics, Basic Quantum Mechanics, Introduction to Computation, Classical Mechanics, Quantum Mechanics, Mathematical Methods in Physics, Electronics, Nuclear Physics Laboratory, Numerical Analysis, Multivariable Calculus

Technical Skills

Languages	Proficient in Python, Java Familiar with Julia, Octave, Sage, Mathematica, R, MATLAB
Packages	Numpy, Scipy, Matplotlib, Seaborn, Pandas, Sympy, PyMC, Cython, Numba, Qiskit
Tools	Linux, Git, \LaTeX , Typst, Origin, Hugo
Other Skills	Familiar with C#(Unity), HTML and CSS

Achievements

2024	Qiskit Fall Fest , Certificate of Achievement
2020 - Present	National Talent Search Examination , NTSE Scholar
2022 - Present	INSPIRE SHE , Inspire Scholar

Experience & Talks

Nov 2024	Talk on Stochastic Thermodynamics , <i>Identity: The Maths Club of IISER Kolkata</i> <ul style="list-style-type: none">○ Gave a talk on conditions under which systems attain equilibrium using stochastic processes and jump networks.(Irreducibility and the Kolmogorov Loop Condition).
2024 - present	Core Committee Member , <i>Identity: The Maths club</i> , IISER Kolkata
2024	Organizing Committee Member , <i>Lexis: The Literary Fest</i> , IISER Kolkata <ul style="list-style-type: none">○ Helped in organising SyFy(A Sci-Fi writing competition) and Event X.
2023 – present	Core Committee Member , <i>Slashdot: Coding and Designing Club</i> , IISER Kolkata <ul style="list-style-type: none">○ I have helped conduct workshops about \LaTeX and the welearn-bot.
2023 – 2024	Convener , <i>IISER Kolkata Quiz Club</i> <ul style="list-style-type: none">○ I have conducted and helped conduct over 20 quizzes over 6-7 months in my tenure.○ I have brought in different quizmasters from all over India to conduct quizzes .

Other Interests

Coding	I enjoy coding quite a lot and have made a lot of projects over the years including Finite Dimensional methods to simulate electric fields, YDSE simulator, MCMC algorithms(Metropolis Hastings Algorithm), Skilling's Nested Sampling framework and some more. Most of my projects are on my GitHub.
Quizzing	I enjoy quizzing and have participated in quizzes all over India over the past 9 years.
Game-Dev	I have coded some small pixel art games using C# in Unity and have a tiny bit of experience coding in Godot.
Pixel Art	I also like pixel art and have made some attempts at creating sprites using Aseprite and Krita.
Blogging	I used to journal offline but now I have a blog up and running called Octopus' Garden hosted at my website where I try to write about stuff I find interesting.