

# G.P. Hrishikesh

Indian Institute of Science Education and Research, Kolkata

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## Education

- 2020 – Present     📖 **BS-MS, Indian Institute of Science Education and Research, Kolkata**  
Pre Majors: Physical Sciences, Mathematical Sciences, Biological Sciences  
**Majors: Physical Sciences**
- 2018 – 2020     📖 **AISSE, Kendriya Vidyalaya Hassan**  
Class 12 – 93%, All India Senior School Certificate Examination (AISSE) .
- 2008 – 2018     📖 **AISSE, Kendriya Vidyalaya Hassan**  
Class 10 – 91.4%, All India Secondary School Examination (AISSE)

## Research Interests

### Spin Glasses, Active Matter, Granular Matter

I am interested in combining computational methods and analytical approaches to explore the fundamental principles behind complex systems.

## Relevant Course Work

Advanced Statistical Mechanics, Advanced Quantum Mechanics, Non-linear Dynamics, Biological Physics, Mathematical Methods of Physics, Condensed Matter Physics, Non-Equilibrium Statistical Mechanics.

## Projects



- Master's thesis     📖 **Vortex Unbinding Transitions**  
Supervisor: Prof. Pradeep Kumar Mohanty, IISER Kolkata  
Two-fold investigation of vortex unbinding transitions in equilibrium and non-equilibrium systems. Experimentally studied the spontaneous formation of vortices in vibrated granular media, revealing a novel non-equilibrium phenomenon. In parallel, a theoretical framework was developed to understand the underlying mechanisms. Additionally, performed numerical studies on the coupled XY-Ising model to explore its phase behaviour. Identified distinct phases and uncovered evidence for a potential new phase characterized by a strong system response to external phase twists, even beyond the vortex unbinding transition.
- Summer Project     📖 **Planar Cell Polarity**  
Supervisor: Prof. Biplab Bose, IIT Guwahati  
Developed a non-equilibrium model of Planar Cell Polarity, and investigated the emergence and dynamics of topological defects within the system.

## Skills






- Languages     📖 Strong reading, writing and speaking competencies for English, Hindi and Kannada.
- Coding     📖 Python, C, Julia, Arduino.
- Web Dev     📖 HTML, CSS.

## Miscellaneous Experience





### Teaching Experience

- Spring 2025     **PH1101: Mechanics I**  
Instructor: Prof. Golam Mortuza Hossain  
Conducted weekly tutorial sessions for 60 students, helped in evaluation and invigilation
- Fall 2024     **PH2202: Thermal Physics**  
Instructor: Prof. Koushik Dutta  
Conducted weekly tutorial sessions for 20 students, helped in evaluation and invigilation



### Miscellaneous Projects and Schools

- 2024     **Worked on phase transition in 2D Ising Model and percolation transition on a fractal lattice under the supervision of Dr. P.K Mohanthy.**
- 2022     **Worked under Dr. Anupam Gupta, IIT Hyderabad, on the problem of 'Locomotion due to delay at microscale'.**
-  **Summer School**  
Attend the course - CURVES AND SURFACES: GEOMETRY AND PHYSICAL APPLICATIONS held in ICTS-TIFR from 17 May 2022 to 15 June 2022.
-  **A Genetic Oscillator approach for periodic drug release**  
This is a novel method to circumvent Medical non-adherence by developing a series of GMOs as drug delivery vehicles with a genetic oscillator with tunable period and amplitude for periodic drug release.
- 2021     **MELAN-KILLY**  
MEALAN-KILLY: a novel method to combat Coffee Berry Disease using GMCs which reduce the Melanin concentration in the pathogen, thereby reducing the infection rate in the host plant. This was presented in the IISER-K level iGEM competition.

### Positions Held

- 2022-2023     **Convener of IISER K's Quiz Club**
- 2021 - 2022     **Core Committee member of SlashDot(IISER K's designing and coding club).**
- 2020-Present     **Member of IISER K's Cricket Club**
-  **Member of IISER K's Kabbadi Club**

### Achievements

- 2018     **KVS National Level Social Science cum Cultural Exchange Program**, Organised jointly by KVS and MHRD.  
Represented Bengaluru region in KVS National Level Social Science Quiz
- 2017     **KVS National Level National Children Science Congress**, Organised jointly by KVS, DST and NCERT.  
Represented Bengaluru region.  
Presented a project titled "TRAP CARBON-DI-OXIDE, TAP LIVELIHOOD"  
This project aims to segregate effluents released while burning firewood and use the same to provide an alternate source of income for the user.

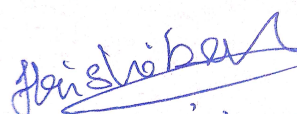
## References

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■ **Prof. Pradeep Kumar Mohanthy**  
Professor, Department of Physical Science  
IISER Kolkata  
Email: [pkmohanthy@iiserkol.ac.in](mailto:pkmohanthy@iiserkol.ac.in)

■ **Prof. Biplab Bose**  
Associate Professor, Department of Biosciences and Bioengineering  
IIT Gauhati  
Email: [biplabbose@iitg.ac.in](mailto:biplabbose@iitg.ac.in)

May 26, 2025

A handwritten signature in blue ink, appearing to read 'Anish Kumar', is written over a faint, light blue rectangular stamp. The signature is fluid and cursive, with a horizontal line drawn underneath the name.