







# Phanindra Dewan

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## Education

- 2022 – . . . . .  **Integrated Ph.D. in Physical Sciences, Indian Institute of Science, Bengaluru**  
CGPA : 9.5.  
PH 250A project title: *Molecular Communication with Active Transport*  
Project guide: Dr. Sumantra Sarkar.  
PH 250B project title: *Competition and Segregation in Active Vertex Model*  
Project guide: Dr. Sumantra Sarkar.
- 2019 – 2022  **B.Sc.(Hons.) in Physics, St. Xavier's College (Autonomous), Kolkata**  
CGPA: 8.65.  
Final year project title: *Symmetries and Conservation Laws in Classical Mechanics: Space-Translational Symmetry and Conservation of Linear Momentum.*  
Project guide: Dr. G. P. Das.
- 2019  **ISC, St. Joseph's School, Darjeeling**  
Percentage obtained in Final Exams: 95.4.
- 2017  **ICSE, St. Joseph's School, Darjeeling**  
Percentage obtained in Final Exams: 93.17.

## Research Experience

-  **Interests:** Biological Physics, Soft Condensed Matter Physics, Statistical Physics
- 2024 – . . . . .  Research Topic: **Competition and Segregation in Active Vertex Model**  
Advisor: Dr. Sumantra Sarkar, IISc.
- Numerically simulated vertex model with cell division and shape-tension coupling to explain the jamming of oncogenic cell clusters in a monolayer culture of epithelial cells, as seen in recent experiments.
- 2023 – . . . . .  Research Topic: **Molecular Communication with Active Transport**  
Advisor: Dr. Sumantra Sarkar, IISc.
- Numerically investigated the effect of the following on the information transmission by diffusing molecules on a one-dimensional lattice: relays on the lattice, active particles and active particles with barriers on the lattice.

## Research Publications


### Pre-Prints

-  1 P. Dewan and S. Sarkar, *A potpourri of results on molecular communication with active transport*, 2024. arXiv: 2410.19411 [cond-mat.stat-mech].  URL: <https://arxiv.org/abs/2410.19411>.

## Skills



- Languages  English, Nepali, Hindi.
- Coding  Python, Mathematica.

## Teaching Experience



Jan - April 2024     **Teaching Assistant for Statistical Mechanics Course PH-202**, Department of Physics, Indian Institute of Science.  
Instructor: Prof. Aweek Bid, IISc.

## Miscellaneous Experience




### Awards and Achievements

- 2019     **The Kalyani Bharti Trust Award for All-Round Excellence, Certificate of Merit**, The Telegraph School Awards for Excellence.
- 2023     **Professor M A Viswamitra Memorial Award - Best 1st Year Int. PhD Student**, Department of Physics, Indian Institute of Science.



### Results in National Examinations

- 2022     **IIT-JAM (Indian Insitute of Technology - Joint Admission Test for Masters)**, All India Rank: 75.
-  **JEST (Joint Entrance Screening Test)**, All India Rank: 15, Percentile: 99.63.



### Conferences/Symposiums Attended

- 2025     **Frontiers in Non-Equilibrium Physics (FNEP) II**, at IMSc, Chennai
- 2024     **Symposium on Non-equilibrium and Active matter Physics (SNAP) 2024**, at IISc, Bengaluru
-  **Biomembranes 2024**, at IISc, Bengaluru

### Posters Presented

- 2025     *Role of interfacial tension in the outcome of cell-competition during cancer initiation across tissues*, **Frontiers in Non-Equilibrium Physics (FNEP) II**, at IMSc, Chennai
- 2024     *A potpourri of results on molecular communication with active transport*, **In-House Symposium 2024, Department of Physics**, at IISc, Bengaluru

### Schools/Summer Courses Attended

-  **Bangalore School of Statistical Physics XV**, at RRI, Bengaluru
- 2023     **Fascinating World of Flows (Summer Course)**, at ICTS, Bengaluru