

LOVE GROVER

Ph.D. candidate in Physics, IISER Mohali · Ph.D. expected December 2026

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RESEARCH INTERESTS

Non-equilibrium statistical physics of active and soft matter — active baths and time-correlated (Ornstein–Uhlenbeck, telegraphic) noise, semiflexible polymers, and fluctuating interfaces (KPZ, Edwards–Wilkinson). Theory developed alongside large-scale particle simulation.

EDUCATION

Ph.D. in Physics — IISER Mohali, India

2017 – expected Dec 2026

Mutual Regulation between Soft Matter Dynamics and Active Environmental Morphology

Advisor: Dr. Abhishek Chaudhuri

BS-MS in Physics — IISER Mohali, India

2011 – 2016

PUBLICATIONS

1. **Love Grover**, Rajeev Kapri, Abhishek Chaudhuri. *Spatial organization of multiple species of active particles interacting with an interface*. **Phys. Rev. E** **111**, 045412 (2025).
2. **Love Grover**, Anil Kumar Dasanna, Abhishek Chaudhuri. *Spectral signatures of active fluctuations in semiflexible polymers*. arXiv:2604.10168 (2026), submitted.

RESEARCH EXPERIENCE

- **Active baths and time-correlated noise**. Implemented a discrete-time Ornstein–Uhlenbeck driving-force module in C++ for LAMMPS (active noise, tunable persistence time). Showed that an active bath is *not* a uniform heat source: it couples selectively to modes whose relaxation times match the bath correlation time, making the chain a mode-resolved probe of its environment.
- **Active particles on fluctuating interfaces**. Established a two-way feedback in which particles locally deform the interface while the evolving surface geometry steers their motion, producing activity-driven spatial organization (Phys. Rev. E 2025).
- **Non-equilibrium interface growth**. Monte Carlo studies of dynamic roughening in the KPZ and Edwards–Wilkinson classes; extracted growth and roughness exponents, benchmarked against continuum theory.
- **Biological membranes**. Minimal statistical model of membranes with multiple protein species; Monte Carlo simulations of how heterogeneous protein interactions modulate membrane morphology and stability.

METHODS AND COMPUTING

- **Theory**: statistical mechanics, stochastic processes (Itô calculus, OU and telegraphic noise), Langevin and Brownian dynamics, active matter, surface-growth models.
- **Simulation**: LAMMPS (including custom C++ modules), Monte Carlo, molecular dynamics.
- **Computing**: Python, C++, Fortran, MATLAB, Mathematica; Linux, HPC/SLURM, Git, $\LaTeX$.

CONFERENCES AND SCHOOLS

- **Poster**: *Spectral Signatures of Active Fluctuations in Semiflexible Polymers*. 12th International Conference on Biological Physics (ICBP 2026), Genoa, Italy, 28 June – 3 July 2026.
- **Poster**: STATPHYS-Kolkata XIII, IISER Kolkata, 2026.
- Bangalore School on Statistical Physics XVI, ICTS Bangalore, 2025.

TEACHING AND MENTORING

- **Undergraduate mentor**, IISER Mohali (2018–2019) — supervised summer students on Vicsek-model simulations of collective motion.
- **Teaching assistant**, IISER Mohali (2017–2019) — Optics, Condensed Matter, Advanced Optics/Spectroscopy, and Modern Physics laboratories.

AWARDS

INSPIRE Scholarship (national merit), Dept. of Science and Technology, Govt. of India (2011–2016). · JEST qualified (2016) · IIT-JEE qualified (2011)

REFERENCES

Dr. Abhishek Chaudhuri (Ph.D. advisor), Professor, IISER Mohali — abhishek@iisermohali.ac.in

Dr. Anil Kumar Dasanna (collaborator), Asst. Professor, IISER Mohali — adasanna@iisermohali.ac.in

Dr. Rajeev Kapri (co-author), Professor, IISER Mohali — rkapri@iisermohali.ac.in