

Shibananda Das

CONTACT INFORMATION

Department of Physics
Indian Institute of Science
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RESEARCH INTERESTS

soft matter, polymer physics, active matter, hydrodynamics, mesoscale simulations

EDUCATION

University of Cologne, Cologne, Germany

Ph.D., Theoretical Physics, January 2018

- Doctoral thesis: *Dynamical Structure Formation in Passive and Active Colloidal Systems*
- Advisors: Prof. Gerhard Gompper and Prof. Roland G Winkler

Indian Institute of Science Education and Research, Pune, India

Integrated B.S.-M.S., Physics, May 2014

- M.S. thesis: *A Multi-scale Simulation Scheme to Investigate Dynamics of Membrane Confined Polymer*
- Advisor: Prof. Apratim Chatterji

RESEARCH EXPERIENCE

Postdoctoral Research

September 2023 to August 2024

Institute for Theoretical Physics,
University of Göttingen
Group: Prof. Marcus Müller

- Fabrication of isoporous membranes via Self-assembly and Nonsolvent-Induced Phase Separation (SNIPS) process of block copolymers and solvents

Postdoctoral Research

September 2020 to July 2023

Department of Polymer Science and Engineering,
University of Massachusetts Amherst
Group: Prof. Murugappan Muthukumar

- Microstructural organization of intrinsically disordered proteins and gelation of polyelectrolytes
- Characterization of thermal transport in polyethylene chains

Postdoctoral Research

September 2018 to August 2020

Department of Chemistry,
Columbia University
Group: Prof. Angelo Cacciuto

- Activity induced conformation and dynamics of polymers
- Hydrodynamics affected motion of active Janus colloids

Research Associate

February 2018 to July 2018

Theoretical Soft Matter and Biophysics Institute (ICS-2 / IAS-2),
Forschungszentrum Jülich
Advisors: Prof. Gerhard Gompper and Prof. Roland G. Winkler

- Local stress and pressure in systems of spherical active Brownian particles

Doctoral Research August 2014 to January 2018
 Theoretical Soft Matter and Biophysics Institute (ICS-2 / IAS-2),
 Forschungszentrum Jülich
 Advisors: Prof. Gerhard Gompper and Prof. Roland G. Winkler

- Hydrodynamic effects on the microstructural properties and short-time dynamics of proteins
- Active turbulence in a dispersion of magnetic colloids energized by an alternating magnetic field
- Stationary-state distribution of active Brownian particles under confinement

Graduate research December 2012 to May 2014
 Department of Physics,
 IISER Pune
 Advisor: Prof. Apratim Chatterji

- Hydrodynamics mediated dynamics of membrane confined polymer

TEACHING

Lecturer
 • Statistical Mechanics Spring 2025
 IISc Bangalore

Teaching assistant
 • Scientific Computing Spring 2024
 University of Göttingen

Guest lecturer
 • Statistical Mechanics Fall 2019
 Columbia University

SERVICES TO THE PROFESSION

Journal Referee
 • Physical Review Letters
 • Physical Review Fluids
 • Physical Review E
 • Polymers
 • Entropy
 • Proceedings of the Royal Society A
 • Communications Physics
 • Journal of Chemical Sciences

Representative in CNS Postdoctoral committee (2020-2021)
 • UMass Amherst, USA

Outreach Program Volunteer
 • Girls' Science Day 2018-2019, Columbia University, USA

GRANTS & AWARDS

Anusandhan National Research Foundation (ANRF)
 • 3-years funding under the IRG scheme 2025-2028

Ministry of HRD, Govt. of India
 • INSPIRE Fellowships in Basic Sciences 2009-2014

Ministry of Social Justice & Empowerment, Govt. of India
 • Dr. Ambedkar National Merit Award 2010

North-East Institute of Science & Technology, Assam, India
 • CSIR Scheme of Cash Award 2007

PRESENTATIONS

Invited Talk

- “Self-organization and transport in and out of equilibrium” June 2025
Soft Matter Young Investigators Meet (SMYIM),
Shimla, India
- “Self-organization of charged macromolecules” February 2025
Interdisciplinary Perspectives on Biomolecular Condensation,
The Institute of Mathematical Sciences, Chennai, India
- “Sequence-specific folding of partially active macromolecules” September 2024
Symposium on Nonequilibrium and Active Matter Physics,
Indian Institute of Science, Bengaluru, India
- “Self-organization of biomolecular condensates” March 2023
The Institute of Mathematical Sciences, Chennai, India
Department of Physical Sciences, IISER Kolkata, India
Department of Physics, IISER Bhopal, India
- “Protein aggregation by specific site-site interaction” July 2016
Institut für Angewandte Physik, Universität Tübingen, Germany

Contributed Talk

- “Sequence-specific folding of partially active polymers” March 2025
DPG Spring Meeting, Regensburg, Germany
- “Microstructural organization in α -synuclein solutions” March 2022
APS March Meeting, Chicago, USA
- “Active filaments: deviations from blob scaling theory and dynamics inside cavities” March 2020
APS March Meeting (via DSOFTE Virtual Meeting), USA
- “Short time dynamics of crowded protein suspensions” June 2016
SoftComp Annual Meeting, Ancona, Italy