

Nandita Chaturvedi

National Institute of Advanced Studies
Bengaluru, Karnataka 560012

nanditac@sas.upenn.edu
Phone: +91 8377058067

Work

National Institute of Advanced Studies
Complex Systems Programme
Visiting Faculty

**Simons Center for Living Machines,
National Center for Biological Sciences, TIFR**
Simons-NCBS Career Development Fellow, 2021 - 2025.

Education

Department of Physics and Astronomy, University of Pennsylvania
Ph.D, 2021.

Institute of Theoretical Physics, University of Cologne
Bonn-Cologne Graduate School of Physics and Astronomy
M.Sc. Physics, 2015

St. Stephen's College, University of Delhi
B.Sc. (Honors) Physics, 2013

Selected Publications

Chaturvedi, Nandita. "Architecture-dependent Effects of Trade-offs on Evolutionary Navigability and Epistasis" *In submission*

Chaturvedi, Nandita, and Archishman Raju. "Learning and Evolution in Heterogeneous Environments Through an Environment to Phenotype Map." *In preparation*

Chaturvedi, Nandita, Charuhansini Tvishamayi and Shashi Thutupalli. "Adaptation to Extreme Stress Under the Growth-Survival Fitness Trade-Off." *Physical Review E* 113.5 (2026): 054403.

Tvishamayi, Charuhansini, Farhan Ali, Nandita Chaturvedi, Nithila Madhu-Kumar, Zeenat Rashida, Chandan Muni Reddy, Ankita Ray, Stephan Herminghaus, and Shashi Thutupalli. "Convergent Cellular Adaptation to Freeze-Thaw Stress via a Quiescence-like State in Yeast." *eLife* (2025): 14:RP106857.

Chaturvedi, Nandita, and Purba Chatterjee. "Evolutionary Adaptation in Heterogeneous and Changing Environments." *Evolution* 79, no. 1 (2025): 119-133.

Chaturvedi, N., and Randall D. Kamien. "Gnomonious Projections for Bend-Free Textures: Thoughts on the Splay-Twist Phase." *Proceedings of the Royal Society A* 476, no. 2234 (2020): 20190824.

Chaturvedi, N., and Randall D. Kamien. "Mechanisms to Splay-Bend Nematic Phases" *Physical Review E* 100.2 (2019) 022704.

Talks and Presentations

Adaptation to Changing Environments, Trade-Offs, and Cellular Learning, Talk, 2026, Universal Biology Institute, University of Tokyo, Tokyo

Mathematical approach to Ecology and Evolution, Gyan Parampara Lecture Series, Talk, 2025, Government College of Engineering, Chhatrapati Sambhaji Nagar

Adaptation to extreme stress under the growth-survival fitness trade-off Department Seminar, Talk, 2025, BAMU, Chhatrapati Sambhaji Nagar

Modeling Adaptation to Freeze-Thaw in Yeast Under Fitness Trade-offs, Workshop on Physical Aspects of Living Systems, Talk, 2025, University of Tokyo, Tokyo

Adaptation in Changing and Heterogeneous Environments, 3rd AsiaEvo Conference, Talk, 2023, National University of Singapore, Singapore

Trade Offs in a Complex Genotype to Phenotype Map, NCBS Annual Talks, Poster, 2023, National Center for Biological Sciences, Bangalore

Adaptation in Changing and Heterogeneous Environments, Stochasticity and Plasticity in Living Systems, Talk, 2023, NCBS, Sakleshpur

Mechanisms to Splay-Bend and Twist-Bend Nematic Phases, Workshop on the Optimal Design of Soft Matter, Poster, 2019, Isaac Newton Institute, Cambridge

Mechanisms to Splay-Bend and Twist-Bend Nematic Phases, MRSEC Review, Poster, 2019, Boston

Mechanisms to Splay-Bend and Twist-Bend Nematic Phases, APS March Meeting, Talk, 2019, Boston

Mechanisms to Splay-Bend and Twist-Bend Nematic Phases, Thesis Proposal, Talk, 2019, University of Pennsylvania, Philadelphia

Random Field Ising Model, Advanced Statistical Physics Symposium, Talk, 2016, University of Pennsylvania, Philadelphia

*Modelling Dorsal-Ventral Patterning in the *Oncopeltus fasciatus* Embryo*, Thesis Symposium, Talk, 2015, University of Cologne, Cologne

Stimulation and Recording of Neural Networks, Biophysics Presentations, Talk, 2014, University of Cologne, Cologne

Dynamics of Falling Paper, National Students' Symposium of Physics, Talk, 2013, Panjab University, Chandigarh

Packaging and Delivery in the Cell, Meera Memorial Paper Presentation, Talk, 2013, St. Stephen's College, Delhi University, Delhi

The Low Reynolds Number World, Meera Memorial Paper Presentation, Talk 2012, St. Stephen's College, Delhi University, Delhi

Workshops and Conferences

Organized the 1st India-Japan Workshop on Physical Aspects of Living Systems, ELSI, Institute of Science Tokyo, Tokyo, 2025

Organized Conference *D.D. Kosambi: Revolutionary Scientist for Our Times*, National Center for Biological Sciences, Bangalore, 2024

Presented at the following:

Theoretical and Empirical Approaches to Understand Polygenic Adaptation, International Center for Theoretical Sciences, Bangalore, 2024

3rd AsiaEvo Conference, National University of Singapore, Singapore, 2023

Stochasticity and Plasticity in Living Systems, hosted by Simons Center, NCBS in Sakleshpur, Karnataka, 2023

Cellular Lineages and Development: From Single Cells to Landscapes hosted by Simons Center, NCBS in Alappuzha, Kerala, 2022

Workshop on Topology, University of Delaware, Newark, 2019

Workshop on the Optimal Design of Soft Matter at the Isaac Newton Institute, Cambridge, 2019

American Physical Society March Meeting, Boston, 2019

Geometrically Frustrated Self-Assembly, Princeton University, Princeton, 2018

Simons Foundation Conference on Theory and Biology, New York, 2017

American Physical Society March Meeting, New Orleans, 2017

Workshop on Topology, University of Pennsylvania, Philadelphia, 2016

**Teaching
Experience**

Vishvanath Sathe Visiting Research Fellowship
Nath Valley School, 2025

National Center for Biological Sciences, TIFR
Lecturer in Monsoon School, 2024

Department of Physics and Astronomy, University of Pennsylvania
Grader, General Physics: Mechanics, Heat and Sound, Spring 2016
Teaching Assistant, Energy, Oil, and Global Warming, Fall 2016
Teaching Assistant, Mathematical Methods of Physics, Fall 2016
Teaching Assistant, Energy, Oil, and Global Warming, Fall 2017
Teaching Assistant, Mathematical Methods of Physics, Fall 2018

Institute of Theoretical Physics, University of Cologne
Teaching Assistant, Statistical Physics, Spring 2015

**Awards and
Fellowships**

Vishvanath Sathe Visiting Research Fellowship, Nath Valley School, 2025
Simon-NCBS Career Development Fellowship, National Center for Biological Sciences, 2021
Scholarship from Bonn-Cologne Graduate School of Physics and Astronomy, 2013
Summer Research Fellowship Programme-2012 by the Indian Academy of Science, 2012
Kishore Vaigyanik Protsahan Yojana (KVPY) scholarship, Department of
Science and Technology, Government of India, 2012
Scholarship for Higher Education (SHE), as part of the INSPIRE Program,
Department of Science and Technology, Government of India, 2012

**Languages
and Skills**

Hindi (native), English (fluent), Kannada (basic), German (basic)
C++, Python, Matlab, Gnuplot, Mathematica, Latex, Inkscape