Gokul G. Nair

Center For Applied Mathematics
Cornell University, NY
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EDUCATION

Ph.D. in Applied Mathematics 2018 - present
Cornell University, Ithaca, NY, United States
Advisor: Timothy Healey, Department of Mathematics
Expected completion: 2024

Masters in Applied Mathematics 2018-2021
Cornell University, Ithaca, NY, United States
Minors: Mathematics, Theoretical Physics

Bachelor of Science (First Class with Distinction) 2014 - 2018
Indian Institute of Science, Bangalore, India
Major: Physics
Thesis Advisors: Chandan Dasgupta & Sriram Ramaswamy, Department of Physics
Thesis Title: *On the Statistics of Extremes in Self-Driven Particles*

VISITING POSITIONS

Visiting Graduate Student Feb - April 2023
Hausdorff Research Institute for Mathematics,
University of Bonn, Bonn, Germany

Visiting Scholar May - July 2017
Department of Engineering Sciences and Applied Mathematics,
Northwestern University, Evanston, IL, United States

RESEARCH INTERESTS

Calculus of Variations, Nonlinear Elasticity, Differential Geometry, Minimal Surfaces, Complex systems

HONOURS/ AWARDS

Graduate Student Teaching Award, Dept. of Math, Cornell 2022

Cornell Research Travel Grant, Cornell University 2022

Mathematics Teaching Development Fellow, Cornell University 2022

First Class with Distinction, Indian Institute of Science 2018

S.N. Bose Fellowship, Indo-U.S. Science and Technology Forum 2017

KVPY Fellowship, Government of India 2014

RESEARCH PUBLICATIONS

1. *Energy minimizing configurations for single-director Cosserat shells*, Timothy J. Healey, Gokul G. Nair. Journal of Elasticity (2023) `arXiv:2208.09051`
2. *Nonlinearly elastic maps: Energy minimizing configurations of membranes on prescribed surfaces*, Timothy J. Healey, Gokul G. Nair. (Submitted 2023) `arXiv:2308.02070`

3. *Stationary curves under the Möbius-Plateau energy*, Max Lipton, Gokul G. Nair. arXiv preprint (2023) `arXiv:2208.12678`
4. *Dynamics and synchronization in random networks of coupled phase-oscillators: A graphon approach*, (with Shriya Nagpal and Francesca Parise). (In preparation 2023)
5. *Designing for robustness in electric grids via a general effective resistance measure*, Shriya V. Nagpal, Gokul G. Nair, Francesca Parise, and C. Lindsay Anderson. IEEE TCNS (2022) `arXiv:2201.00929`
6. *Fission-fusion dynamics and group-size-dependent composition in heterogeneous populations*, Gokul G. Nair, Athmanathan Senthilnathan, Srikanth K. Iyer, and Vishwesha Guttal. Physical Review E (2019) `arXiv:1711.06882`

TEACHING EXPERIENCE

- Calculus II, Instructor (Fall 2022)
- Partial Differential Equations, Grader (Spring 2022)
- Differential Equations for Engineers, TA (Fall 2021)
- Honours Introduction to Analysis I, Grader (Fall 2020)
- Multivariable Calculus, TA (Spring 2020)
- Differential Equations for Engineers, TA (Fall 2019)
- Multivariable calculus for Engineers, TA (Fall 2018 - Spring 2019)

TALKS

- **Hausdorff Center for Mathematics, Bonn, Workshop on Nonlinear PDEs: Recent Trends in the Analysis of Continuum Mechanics:** *Energy Minimizing Configurations for Single-Director Cosserat Shells* (2023)
- **Hausdorff Institute, University of Bonn, Workshop on Variational methods for complex phenomena in solids:** *Energy Minimizing Configurations for Single-Director Cosserat Shells* (2023) **Invited talk*
- **Hausdorff Institute, University of Bonn, Work group seminar:** *Convex Integration for the p-Laplace equation* (2023)
- **Cornell University, Analysis Seminar:** *Energy Minimizing Configurations for Highly Deformable Elastic Surfaces* (2022)
- **University of Ulm, Horizons in Nonlinear PDEs Summer School:** *Energy Minimizing Configurations for Highly Deformable Elastic Surfaces* (2022)
- **Cornell University, Applied Dynamics Seminar:** *Schoen and Yau's proof of the Positive Mass theorem* (2021)
- **Cornell University, Applied Math Student Seminar:** *Introduction to Curvature* (2020)
- **Cornell University, Dynamics Seminar:** *Proving the Uniformization theorem using Ricci flow* (2020)
- **Cornell University, Mathematics Teaching Seminar:** *Promoting Creative Reasoning via Good Questions*, with S. Ong (2022)
- **Cornell University, Applied Dynamics Seminar:** *On the Dynamics of Power Grids* (2022)
- **Cornell University, REU programme:** *Introduction to Synchronization and the Kuramoto model* (2019)

CONFERENCES/ WORKSHOPS

- Workshop on Nonlinear PDEs: Recent Trends in the Analysis of Continuum Mechanics, Hausdorff Center for Mathematics, University of Bonn, Germany (2023)
- Workshop on Variational Methods for Complex Phenomena in Solids, Hausdorff Institute for Mathematics, University of Bonn, Germany (2023)
- Mathematics for Complex Materials Trimester Programme, Hausdorff Institute for Mathematics, University of Bonn, Germany (2023)
- Horizons in Nonlinear PDEs Summer School, University of Ulm, Germany (2022)
- Communicating Mathematics Conference, Cornell University (2022)
- STEM Communication Workshop, Alan Alda Center for Communicating Science (2021)

SERVICE

- Facilitator, Mathematics TA training programme (2023)
- President, Cornell SIAM chapter (2021-2022)
- Teaching Development Fellow, Cornell Department of Mathematics (Fall 2022)
- Organizer, Mathematics teaching seminar (Fall 2022)
- Organizer, Applied Mathematics Student Seminar (2020-2022)
- Mentor, Directed Reading Programme, Cornell Department of Mathematics (2020-2022)
- Expanding Your Horizons Volunteer, Cornell University (2022)
- Facilitator, Mathematics TA training programme (2020)

HUMAN LANGUAGES

- Native proficiency: English, Malayalam
- Fluent: Hindi, Kannada
- Limited proficiency: Tamil, Sanskrit

COMPUTER LANGUAGES

C, C++, Python (Numpy, Scipy, Fenics), Mathematica, LaTeX, HTML, CSS