Dr. Anupama Sebastian

Teaching Aspirant | Physicist | Inquiring Researcher

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Anupama Sebastian

RESEARCH INTERESTS

Nonlinear Dynamics	Self-organisation
Pattern Formation	Complex Systems
Collective Phenomena	Self-propelled Motion
BZ Reaction	Cardiac Arrhythmia
Excitable Media	Far-From-Equilibrium Systems

PERSONAL DETAILS

Name:	Anupama Sebastian
Date of Birth:	06/08/1995
Gender:	Female
Nationality:	Indian
Marital Status:	Married

EDUCATION

PhD in Physics

National Institute of Technology Karnataka, India

July 2019 – May 2025

Thesis title: **Dynamics and Control of Chemical Excitation Waves in Belousov-Zhabotinsky Reaction in the Presence of Static and Rotating Electric Fields**
Supervisor : Dr. T.K. Shajahan.

Masters in Physics

National Institute of Technology Karnataka, India

July 2016 – June 2018

Thesis title: **Unpinning of Spiral Wave Pinned to Heterogeneities in Excitable Media**
Supervisor : Dr. T.K. Shajahan.

Bachelors in Physics

Providence Women's College, Calicut
Affiliated to University of Calicut, India

June 2013 - June 2016

Thesis title: **Study of Globular Cluster**
Supervisor : Dr. Jeena. K

SKILLS

- **Numerical Methods for Partial Differential Equations (PDEs):** Skilled in applying the Finite Difference Method (FDM) to solve PDEs and using the Phase Field Method to model complex systems involving phase transitions or changes in interfaces.
- **Programming Skills:** Solid working knowledge in Python, Bash (for shell scripting), C, C++.
- **Server Management and Data Handling:** Experienced in running code on servers and extracting data for analysis or processing.
- **Version Control Tools:** Proficient in using Git for managing code changes.
- **Markup Languages:** Proficient in LaTeX and HTML.
- **Analytical Skills:** Strong mathematical and data interpretation abilities.
- **Scientific Visualization and Image Analysis Tools:** Proficient in using Mayavi for 3D data visualization, ImageJ for image processing and analysis, and Inkscape for creating vector graphics and scientific illustrations.
- **Communication:** Proficient in academic communications,including delivering PowerPoint presentations and giving talks..

EXPERIENCE

2026 September –	Currently working as Assistant Professor (On Contract) at Department of Physics, Calicut University Campus.
2026 (July – September)	Worked as Assistant Professor (On Contract) at Department of Physics, Farook College (Autonomous).
2020 – 2024	Mentored five Masters student projects, with one leading to conference proceedings at NITK.
2020 – 2023	Teaching Assistance for Statistical & Thermal Physics and Classical Mechanics for M.Sc. course at NITK.
2019 – 2024	Led laboratory practices for M.Sc. and B.Tech. Physics Lab at NITK Surathkal.

ACHIEVEMENTS

- **January 2023:** Secured the **94th rank for the post of Assistant Professor in Physics** in the examination conducted by **Kerala PSC.**
- **June 2019**: Qualified **CSIR-UGC-NET**, securing eligibility for Lectureship (NET).
- **March 2019**: Cleared **JEST-2019** (Joint Entrance Screening Test) with rank 277.
- **March 2018**: Qualified **GATE-2018** (Graduate Aptitude Test in Engineering) in Physics with rank 2116.
- **March 2016**: Qualified **JAM-2016**.
- **2016**: Secured 9th rank in the All Kerala Physics Talent Search Examination (TSE) conducted by APT, Kerala.

PUBLICATIONS

Journal Articles

- V. B. Meshram, **Sebastian, A**, P. Sibeesh, and T. Shajahan, "Influence of oil density on self-propelled motion of belousov-zhabotinsky reaction droplet," *Northeast Journal of Complex Systems (NEJCS)*, vol. 7, no. 1, p. 2, 2025.
- **Sebastian, A**, P. Sibeesh, S. Amrutha, S. Punacha, and T. Shajahan, "Effect of electric field chirality on the unpinning of chemical waves in the belousov–zhabotinsky reaction," *Chaos, Solitons & Fractals*, vol. 186, p. 115 209, 2024.
- S. Amrutha, **Sebastian, A**, P. Sibeesh, S. Punacha, and T. Shajahan, "Theory and experiments of spiral unpinning in the belousov–zhabotinsky reaction using a circularly polarized electric field," *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 33, no. 6, 2023.
- S. Amrutha, **Sebastian, A**, P. Sibeesh, S. Punacha, and T. Shajahan, "Mechanism of spiral wave unpinning in the belousov–zhabotinsky reaction with a dc electric field," *The Journal of Physical Chemistry C*, 2022.
- S. Punacha, S. Berg, **Sebastian, A**, V. I. Krinski, S. Luther, and T. Shajahan, "Spiral wave unpinning facilitated by wave emitting sites in cardiac monolayers," *Proceedings of the Royal Society A*, vol. 475, no. 2230, p. 20 190 420, 2019.

International Proceedings

- P. R. Mishra, **Sebastian, A**, and T. Shajahan, "Drift and annihilation of a counter-rotating spiral pair in belousov-zhabotinsky reaction under a dc electric field," in *Springer Proceedings in Physics, vol 314*, Springer, 2024, pp. 429–437.
- **Sebastian, A**, S. Amrutha, S. Punacha, and T. Shajahan, "Dynamics of chemical excitation waves subjected to sub-threshold electric field in a mathematical model of the belousov-zhabotinsky reaction," in *Nonlinear Dynamics and Applications*, Springer, 2022, pp. 1241–1249.

PARTICIPATION/ACTIVITIES

- Participated and presented a paper as an online speaker at the **International Conference on Nonlinear Science and Complexity** (**ICNSC 2023**) held at Biruni University, Turkey.
- Participated and presented a poster at the **Perspectives in Nonlinear Dynamics 2023 (PNLD 2023)**, co-organized by the Center for Complex Systems and Dynamics, IIT Madras.
- Participated and presented a paper at the International Conference on Nonlinear Dynamics and Applications (**ICNDA 2022**).
- Participated in the 13th Conference on Nonlinear Systems and Dynamics (**CNSD 2021**).
- Participated in a two-week workshop on Scientific Computing Using Matlab & Python (**SCMP-2020**).
- Between 2019 and 2020, actively participated in the **science outreach initiative, "The Principia,"** conducted by the Department of Physics, NITK, for school students in rural areas of Karnataka and Kerala, India.

REFEREES

Dr. T K Shajahan
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Department of Physics,
National Institute of Technology Karnataka (NITK)
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Professor,
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