

BREAKOUT GRADUATE FELLOWSHIP

Ph.D. in Mathematics, Amrita Vishwa Vidyapeetham, India



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CONTEXT

In rural India, opportunities for higher studies in mathematics are limited, particularly for women who face challenges in finding mentors and supervisors. Many students travel long distances to pursue their education while managing family responsibilities. Personally, I have seen how difficult it is for aspiring female scholars to balance these challenges. Despite a strong interest in applied mathematics, few pursue research careers due to these barriers. Initiatives to improve research training and mentorship are essential to support local talent and create an inclusive academic environment.

CDC SUPPORTED ACTIVITY

I joined the Ph.D. program in Mathematics at Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, in 2021 under the supervision of Dr. P. Prakash. Initially unfunded, I received the IMU Breakout Graduate Fellowship in October 2023, which provided crucial financial support and opened new collaboration opportunities. Under this fellowship, I had the privilege to collaborate with eminent researchers: the world-renowned mathematical physicist Prof. M. Lakshmanan and Prof. R. Sahadevan (regional), and Prof. Stephane Victor (international).

IMPACT

The IMU Breakout Graduate Fellowship provided crucial financial support that allowed me to balance my Ph.D. research with family responsibilities, including raising my son and supporting his education. This support enabled focused research, development of advanced analytical methods for solving higher-dimensional fractional nonlinear PDEs, and growth in scientific writing and independent research. The fellowship strengthened my regional collaborations with Prof. M. Lakshmanan and Prof. R. Sahadevan, and an international collaboration with Prof. Stephane Victor. It also enhanced my mentoring abilities, guiding a M.Sc. Mathematics student in mathematical research. Also, I could independently purchase essential tools like a printer, books, and other utilities to enrich my research and develop new skills. I completed my Ph.D. with 8 SCI/SCIE journal publications and one conference proceedings. The fellowship provided me stability with personal and academic life, which helped me follow my chosen academic career in a better way. After my Ph.D. I was offered the position of assistant professor in Mathematics. Not only did the fellowship benefit me, it serves as an inspiration to local students and the community in rural Palakkad, Kerala, demonstrating that girls from modest backgrounds can pursue quality research while maintaining family well-being, thereby encouraging better educational opportunities for women in mathematics.

OUTCOMES AND ACHIEVEMENTS

Selected Scholarly Outputs and DOIs (2024–2025)

- 2024 (Collaboration with M. Lakshmanan and R. Sahadevan)
 - doi.org/10.1140/epjs/s11734-024-01190-7
 - doi.org/10.1016/j.cnsns.2024.108123
 - doi.org/10.1007/s13540-024-00330-z
- 2025 (Collaboration with S. Victor, and M. Lakshmanan)
 - doi.org/10.1016/j.chaos.2025.116738
 - doi.org/10.1016/j.chaos.2024.115852

Timeline of Key Events:

- October 2023: IMU BGF Award
- February 2024: Qualifying Exam Completed
- April 2025: Open Seminar II
- June 2025: Ph.D. Synopsis and Thesis Submission
- September 2025: Thesis Defended successfully
- December 2025: Convocation and Degree Award

Research Topic: Studies on Analytical Solutions of Scalar and Coupled Systems of Higher-Dimensional Nonlinear Time-fractional Partial Differential Equations

Formal oral defense and presentation to the committee

Official graduation and accepting position of Assistant Professor in Mathematics



REFLECTIONS

My Ph.D. journey supported by the IMU Breakout Graduate Fellowship enabled me to develop analytical methods for higher-dimensional nonlinear time-fractional PDEs while successfully balancing family responsibilities. It provided crucial financial stability, enhanced my research network through regional and international collaborations, and significantly increased my visibility. Immediately after thesis submission, I was offered the position of Assistant Professor in Mathematics at Amrita Vishwa Vidyapeetham, Kollam, Kerala, a direct outcome of the recognition brought by the fellowship. This fellowship has been one of the most transformative awards in my life, giving me the confidence and platform to pursue higher goals while inspiring students and young women in rural Palakkad to believe in quality mathematical research and better educational opportunities. Now, I am working at the Government College in my native place, where I am working on encouraging younger students to learn and pursue mathematics while showing the role of mathematics in these AI-versed days.

This activity was supported by the International Mathematical Union Commission for Developing Countries and several winners of the Breakthrough Prize for Mathematics.