

# Nikhil Manoj

Thiruvananthapuram, Kerala, India

[Google Scholar](#) | [ResearchGate](#) |

Email: [nikhilmanoj2020@iisertvm.ac.in](mailto:nikhilmanoj2020@iisertvm.ac.in) | Phone: +91 9605148995



## ABOUT ME

I am a Ph.D. candidate in Mathematics at IISER Thiruvananthapuram, India. I specialize in high-resolution numerical methods for hyperbolic conservation laws. My current research focuses on designing and analyzing high-order numerical schemes for conservation laws involving discontinuous and non-local fluxes.

## RESEARCH INTERESTS

- High-resolution numerical methods for hyperbolic conservation laws.
- Conservation laws with non-local and discontinuous fluxes.
- Discontinuous Galerkin methods.

## CURRENT POSITION

**Position** : Ph.D. candidate, School of Mathematics, IISER Thiruvananthapuram  
**Thesis title** : High-order numerical schemes for local and non-local conservation laws  
**Ph.D. advisor** : Dr. Sudarshan Kumar K.  
**Thesis submission date** : 31 May, 2025 (expected)

## PUBLICATIONS

1. **Nikhil Manoj**, Veerappa Gowda G. D. and Sudarshan Kumar Kenettinkara. "Convergence of a second-order scheme for non-local conservation laws" *ESAIM: M2AN*, 57 (6) 3439-3481(2023). DOI: 10.1051/m2an/2023080.
2. **Nikhil Manoj**, Veerappa Gowda G. D. and Sudarshan Kumar Kenettinkara. "A positivity preserving second-order scheme for multi-dimensional system of non-local conservation laws" (*preprint, submitted*), (2024). Available at: 10.48550/arXiv.2412.18475.
3. **Nikhil Manoj** and Sudarshan Kumar Kenettinkara. "Analysis of a central MUSCL-type scheme for conservation laws with discontinuous flux." (*preprint, submitted*), (2025). Available at: 10.48550/arXiv.2501.04620.

## TECHNICAL SKILLS

|                               |                |                             |                         |
|-------------------------------|----------------|-----------------------------|-------------------------|
| <b>Programming Languages</b>  | Python, C++    | <b>Programming Software</b> | MATLAB                  |
| <b>Visualization Software</b> | VisIt, Gnuplot | <b>Dev Tools</b>            | Visual Studio Code, Git |

## EDUCATION

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|---|--|
| <b>Indian Institute of Science Education and Research (IISER) Thiruvananthapuram</b><br><i>Ph.D. in Mathematics</i>         | Thiruvananthapuram, India<br>2025 (expected) |
| <b>Cochin University of Science and Technology</b><br><i>M.Sc. in Mathematics (CGPA: 8.43/10.00)</i>                        | Kochi, India<br>2020                         |
| <b>St. Berchmans College</b><br><i>B.Sc. in Mathematics (CCPA: 9.66/10.00)</i>  | Changanassery, India<br>2018                 |
| <b>Central Board of Secondary Education</b><br><i>12th grade (Aggregate percentage: 95.4 with A1 grade in all subjects)</i> | India<br>2015                                |

## WORKSHOPS AND CONFERENCES ATTENDED

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- “EQUADIFF-2024” held at Karlstad University, Sweden during 10-14 June, 2024.
- “Finite Volume and Spectral Methods for Hyperbolic Problems” held during 04-15 December 2023 at TIFR-CAM.
- “International Congress on Industrial and Applied Mathematics (ICIAM)-2023” held during 20-25 August, 2023 at Waseda University, Tokyo.
- “Frontier Symposium in Mathematics” April 2022 and February 2023 held at IISER Thiruvananthapuram.
- “Numerical Methods for Partial Differential Equations” conducted by National Center of Mathematics and IISER Thiruvananthapuram, September 2022.
- “The Fourth BRICS Mathematics Conference” December 2021 held at IISER Thiruvananthapuram.
- “Training Program in Mathematics 2017” held during 22 May-17 June 2017 at NISER Bhubaneswar.

## RESEARCH TALKS

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- *Convergence of a second-order scheme for non-local traffic flow problems.*  
Contributed talk at International Congress on Industrial and Applied Mathematics (ICIAM)-2023, Waseda University, Tokyo.
- *Convergence of a second-order scheme for non-local conservation laws.*  
Contributed talk at EQUADIFF-2024, Karlstad University, Sweden.

## TEACHING EXPERIENCE

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- **Tutor**, NCM-Advanced Training in Mathematics Workshop (ATMW) on “Numerical Methods for Partial Differential Equations,” held at the Indian Institute of Petroleum and Energy, Visakhapatnam, India, from 16th–27th December 2024.
- **Teaching Assistant**, IISER-TVM (2021-2025), for the following courses:
  - MAT111 – Single Variable Calculus
  - IDC121 – Mathematical Tools II
  - MAT211 – Multivariable Calculus
  - MAT314 – Numerical Analysis
  - MAT315 – Mathematical Statistics
  - MAT323 – General Topology

## INTERNSHIPS

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| <b>Summer intern</b><br><i>Chennai Mathematical Insitute</i>   | May – June 2019<br><i>Chennai, India</i> |
| <ul style="list-style-type: none"><li>• Undertook a reading project to explore Galois theory, under the guidance of Prof. R. Sridharan.</li></ul>                  |  |
| <b>Indian Academy of Sciences summer intern</b><br><i>Chennai Mathematical Insitute</i>  | May-June, 2018<br><i>Chennai, India</i>  |
| <ul style="list-style-type: none"><li>• Engaged in a reading project to explore the theory of rings in algebra, under the guidance of Dr. Manoj Kummini.</li></ul> |  |

## ACADEMIC ACHIEVEMENTS

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- (2024) Awarded SERB (Science and Engineering Research Board, Govt. of India) International Travel Scheme grant to attend the conference EQUADIFF-2024 at Karlstad University, Sweden.
- (2023) Awarded NBHM (National Board of Higher Mathematics, Govt. of India) sponsorship to attend International Congress on Industrial and Applied Mathematics (ICIAM)-2023, Tokyo.
- (December 2019) Qualified CSIR (Council of Scientific and Industrial Research, Govt. of India)-National Eligibility test for Junior Research Fellowship with All India Rank 24.

- (June 2019) Qualified CSIR (Council of Scientific and Industrial Research, Govt. of India)-National Eligibility test for Lectureship.
- (2018) Selected for Indian Academy of Sciences Summer Research Fellowship Program(SRFP).
- (2015) Awarded the INSPIRE Scholarship for Higher Education (SHE) by the Department of Science and Technology, Government of India, for the period 2015–2020, in support of higher education in basic sciences.

## ORGANIZATIONAL EXPERIENCE

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### Student organizer

*Latest Advances in Computational and Applied Mathematics-2024 (LACAM-24)*

February 21 -24, 2024

*IISER Thiruvananthapuram, Kerala, India.*

### Evaluator

*Vidyarthi Vigyan Manthan- India's Largest Science Talent Search*

May 20-21, 2023

*IISER Thiruvananthapuram, Kerala, India*

### Student member

*School Committee on Postgraduate Programs (SCPP)*

*IISER Thiruvananthapuram, Kerala, India*

## BIO DATA

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**Date of Birth** : 06 May 1997

**Nationality** : Indian

**Blood group** : B+ve

**Language proficiency** : English (Full working proficiency), Malayalam (Native), Hindi, Tamil (Partial fluency)

## REFERENCES

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### Dr. Sudarshan Kumar K

Assistant Professor  
School of Mathematics  
IISER Thiruvananthapuram  
sudarshan@iisertvm.ac.in

### Dr. Nagaiah Chamakuri

Associate Professor  
School of Mathematics  
IISER Thiruvananthapuram  
nagaiah.chamakuri@iisertvm.ac.in

### Dr. K. R. Arun

Associate Professor  
School of Mathematics  
IISER Thiruvananthapuram  
arun@iisertvm.ac.in

### Prof. G. D. Veerappa Gowda

Centre for Applicable Mathematics  
TIFR Bangalore  
gowda@tifrbng.res.in