NIKHIL MANOJ

nikhilmanoj2020@iisertvm.ac.in
Senior Research Fellow
School of Mathematics ⋄ IISER Thiruvananthapuram

RESEARCH INTERESTS

- High-resolution numerical methods for hyperbolic conservation laws.
- Non-local conservation laws.
- Conservation laws with discontinuous flux.
- Discontinuous Galerkin methods.

EDUCATION

Ph.D. Mathematics 2025 (expected)
Indian Institute of Science Education and Research Thiruvananthapuram

M.Sc. Mathematics April 2020
Cochin University of Science and Technology, Kerala
CGPA: 8.43/10.00

B.Sc. Mathematics March 2018
St. Berchmans College, Changanassery, Kerala
CCPA: 9.66/10.00

12th grade 2015
CBSE
Aggregate percentage: 95.4 with A1 grade in all subjects

10th grade 2013
CBSE
CGPA: 10.00/10.00

DOCTORAL DEGREE DETAILS

Thesis title: High-order numerical methods for local and non-local conservation laws.
Ph.D. supervisor: Dr. Sudarshan Kumar K
Current position: Senior Research Fellow

PUBLICATIONS

1.Convergence of a second-order scheme for non-local conservation laws - Veerappa Gowda G. D., Sudarshan Kumar Kenettinkara, Nikhil Manoj, ESAIM: M2AN 57 (6) 3439-3481(2023), DOI: https://doi.org/10.1051/m2an/2023080

2. A positivity preserving second-order scheme for multi-dimensional system of non-local conservation laws - Nikhil Manoj, Veerappa Gowda G. D., Sudarshan Kumar Kenettinkara, DOI: 10.48550/arXiv.2412.18475

3. Analysis of a central MUSCL-type scheme for conservation laws with discontinuous flux. Nikhil Manoj and Sudarshan Kumar Kenettinkara, DOI: 10.48550/arXiv.2501.04620

ACHIEVEMENTS

2024 Awarded SERB International Travel Scheme grant to attend the conference EQUADIFF-2024 at Karlstad University, Sweden.
2023 Awarded NBHM (National Board of Higher Mathematics, Government of India) sponsorship to attend International Congress on Industrial and Applied Mathematics (ICIAM)-2023, Tokyo.
2019 Qualified CSIR-NET for Junior Research Fellowship with All India Rank 24.
2019 Qualified CSIR-NET for Lectureship.
2018 Selected for Indian Academy of Sciences Summer Research Fellowship Program(SRFP).
2015 Awarded INSPIRE Scholarship for Higher Education(SHE) by DST, Government of India for the period 2015-2020.

INTERNSHIPS

2019 Summer internship at Chennai Mathematical Insitute under the guidance of Prof. R. Sridharan.
2018 Indian Academy of Sciences summer internship at Chennai Mathematical Institute under the guidance of Dr. Manoj Kummini.

WORKSHOPS/ CONFERENCES ATTENDED

- "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.

TALKS

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

TEACHING EXPERIENCE

- Tutor at NCM-Advanced Training in Mathematics Workshop (ATMW) on "Numerical Methods for Partial Differential Equations" held at Indian Institute of Petroleum and Energy, Visakhapatnam, India from 16th-27th December 2024.
- **Teaching assistantship at IISER-TVM:**
  - MAT111- Single variable calculus.
  - IDC121- Mathematical Tools II.
  - MAT211- Multivariable calculus
  - MAT314- Numerical Analysis.
  - MAT315- Mathematical Statistics.
  - MAT323- General Topology

COMPUTATION SKILLS

Programming languages: Python, C++
Programming software: MATLAB
Visualisation software: VisIt, Gnuplot

REFERENCES

Dr. Sudarshan Kumar K
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