Sujoy Basak
Ph.D. in Mathematics
Indian Institute of Technology Delhi

+91-7576810180
sujoybasak42@gmail.com
maz228082@maths.iitd.ac.in

Education

- **Indian Institute of Technology Delhi** *August 2022- Present*
  Ph.D. in Mathematics Coursework CGPA: 8.75
  I am currently a research scholar at the Department of Mathematics, Indian Institute of Technology, Delhi, and working under the guidance of *Prof. Harish Kumar*. I am also collaborating with *Prof. Praveen Chandrashekar* at TIFR Bangalore, India. My broad area of research is numerical methods for hyperbolic PDEs. In particular, I am primarily working on Lax-Wendroff flux reconstruction numerical methods for relativistic hydrodynamics and related plasma flow models. These equations are highly nonlinear systems of Hyperbolic PDEs. We are working on developing stable, accurate, and efficient numerical methods for these models.

- **Tezpur University, Tezpur, Assam** *July 2019-August 2021*
  M.Sc. in Mathematics CGPA: 8.36

- **Science College, Kokrajhar, Assam (Gauhati University)** *August 2016-July 2019*
  B.Sc. with Mathematics Major CGPA: 7.70

Research Interests

- High Order Numerical Methods for Hyperbolic PDEs, Conservation Laws, Relativistic Models

Related Courses

- **Ph.D.**
  - –Applied Numerical Analysis, Computational Methods for Differential Equations, Finite Element Theory and Applications
  - –Analysis, Linear Algebra
- **M.Sc.**
  - –Partial Differential Equations, Ordinary Differential Equations
  - –Numerical Analysis, Computer Programming
  - –Functional Analysis, Fourier Analysis, Lebesgue Measure and Integration, Operator Theory-I

Published Research Articles

- S. Basak, A. Babbar, H. Kumar, and P. Chandrashekar. Bound preserving Lax-Wendroff flux reconstruction method for special relativistic hydrodynamics. *Journal of Computational Physics*, 527:113815, 2025.

Workshops

- Attended *NCM workshop on Numerical Methods for Partial Differential Equations* held at IIPE, Visakhapatnam. *December 16, 2023 - December 27, 2024*
- Attended *Workshop on Finite Volume and Spectral Methods for Hyperbolic Problems* held at CAM, TIFR, Bangalore. *December 04, 2023 - December 15, 2023*
- Attended a workshop on MATLAB held at IIT Delhi. *January 21, 2023 - January 22, 2023*

Teaching Assistantships

- Computing Laboratory (MTP290) at IIT Delhi. *January, 2024 - Present*
- Computational Methods for Differential Equations (MTL712) at IIT Delhi. *July, 2024 - November, 2024*
- Computing Laboratory (MTP290) at IIT Delhi. *January, 2024 - April, 2024*
- Calculus (MTL100) at IIT Delhi. *July, 2023 - November, 2023*
- Mathematics of class XI and XII at KV, JNU Campus. *November, 2023 - Present*

Awards and Achievements

- Awarded the Prime Minister's Research Fellowship (PMRF) July 2023
- Qualified CSIR-UGC NET (JRF) June 2021, AIR-109
- Qualified GATE 2021 and GATE 2022
- Qualified IIT-JAM 2019
- Qualified SLET (NE region) 2021

Technical Skills and Interests

- **Programming Languages**: Julia, C, Python, Fortran
- **Softwares and Tools**: MATLAB, Mathematica, git, Paraview, PETSc
- **Operating Systems**: macOS, Linux, Windows
- **Text Formatting and Office Computing**: LaTeX, Microsoft Office

Projects

- **A Representation of $[0, 1]$ via Cantor Set.**
  Thesis Project / During M.Sc. with Dr. Deepjyoti Goswami, Asst. Prof., Tezpur University

- **An Improved Method for Finding Multiple Roots of a Nonlinear Equation and Their Multiplicity.**
  Course project / During Ph.D. coursework, in the course Applied Numerical Analysis

- **A Study of Sequential Convergence in Different Analytical Aspects.**
  Degree project / During B.Sc. with Dr. Mamoni Dhar, HOD, Dept. of Mathematics, Science College, Kokrajhar

Extra Curricular Participation

- Represented my district in a State Level Speech Competition organized by Ministry of Youth Affairs and Sports, Government of India *7^{th} February, 2019*