HARIKRISHNAN S

Mathematics • Geometry

BS–MS Mathematics, IISER Thiruvananthapuram

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RESEARCH EXPERIENCE

Geometric Analysis
Jan 2026 – Apr 2026

Research Project | Guide: Dr Dhriti Sundar Patra • IIT Hyderabad

Worked on Ricci solitons and gained experience in Riemannian Geometry.

Symplectic Geometry
Jun 2024 – Apr 2025

Master's Thesis | Guide: Dr Shrihari Sridharan • IISER Thiruvananthapuram

Investigated foundational concepts in symplectic geometry, with a focus on the Darboux and Moser theorems. Developed a comprehensive understanding of key structures, including Lagrangian submanifolds, contact manifolds, and the dynamics of Hamiltonian systems. Explored connections to mathematical physics through moment maps and Noether's principle, and broadened my study to include Poisson geometry and introductory several complex variables.

Synchronization in Dynamical Networks
Jan 2024 – May 2024

Minor Thesis | Master Stability Function | Guide: Dr Chandrakala Meena

Used the Master Stability Function framework to study synchronisation in coupled dynamical networks.

Topological Descriptors in Data Analysis
Apr 2023 – Oct 2023

Internship at IIT Madras

Applied concepts from algebraic topology and graph theory to help develop a machine learning model for materials science. **DOI: 10.1039/D4RA07703B**

Graph Theory
Dec 2022

Winter Internship | Guide: Dr Aparna Lakshmanan • CUSAT

Engaged in a guided study of fundamental topics in graph theory, including directed graphs, connectivity, trees, independent sets, matching, Eulerian and Hamiltonian graphs, graph colouring, and planarity. Emphasis was placed on proof-based methods and structural aspects of graphs.

Analysis & Fractal Geometry
Jun 2022 – Jul 2022

Summer Internship | Guide: Dr Shrihari Sridharan • IISER Thiruvananthapuram

Analysed the rigorous construction of real numbers from rationals using Dedekind cuts and Cauchy sequences. Investigated key topological properties of fractal sets (including the Cantor set, Sierpinski triangle, and Koch curve), determining if they were compact, countable, or perfect sets.

EDUCATION

IISER Thiruvananthapuram
Dec 2020 – May 2025

BS–MS Dual Degree in Mathematics, CGPA: 8.53/10

TECHNICAL SKILLS

Blender 3D | Python | PyTorch | NumPy | Pandas | DGL | Typst | LaTeX

LANGUAGES

- English (IELTS 7.5)
- Hindi (Fluent)
- Malayalam (Native)

RELEVANT COURSEWORK

- Algebraic Topology
- Analysis on Manifolds
- Complex Analysis
- Differential Geometry
- Fourier Analysis
- Functional Analysis
- General Topology
- Hyperbolic Geometry
- Measure Theory
- Partial Differential Equations

CONFERENCES & WORK-SHOPS

- Topics in Complex Analysis — NCM Advanced Instructional School, 2025
- Symplectic Geometry Mini-Workshop — Chennai Mathematical Institute, 2024
- Frontiers Symposium in Mathematics, (2023–2025)
- The Fourth BRICS Mathematics Conference 2021

REFERENCES

Dr Shrihari Sridharan
IISER Thiruvananthapuram
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Dr Dhriti Sundar Patra
IIT Hyderabad
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