

N. Dileep Varikuti

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About me

Hi, I am **Naga Dileep Varikuti**. I am currently holding a research scholar position at **Indian Institute of Technology Madras, Chennai**, working under the supervision of **Prof. Vaibhav Madhok**. My research interests include quantum information theoretic aspects of quantum chaos. Currently, I am working on scrambling of quantum information in many-body systems.

Education

- 2018 – **Ph.D., Indian Institute of Technology Madras, Chennai** in Theoretical Physics.
Research area: *Information scrambling and chaos in many-body quantum systems*.
Mentor: Prof. Vaibhav Madhok
CGPA: 8.06
- 2016 – 2018 **M.Sc., Visvesvaraya National Institute of Technology, Nagpur** in Physics.
Thesis title: *The Schmidt Decomposition in Quantum Mechanics - Bipartite and Multipartite Quantum Systems*.
Mentor: Dr. M. S. Ram Karthik
CGPA: 7.65
- 2013 – 2016 **B.Sc., Andhra Loyola College (Autonomous), Vijayawada** in Maths, Physics, Statistics.
Percentage of marks obtained: 90.3
- 2011 – 2013 **Intermediate, RamaKrishna Sahakara Junior College, Guntur** in Maths, Physics, Chemistry.
Percentage of marks obtained: 95.1
- 2010 – 2011 **SSC, SVVN High School, 75-Tyallur**.
Percentage of marks obtained: 94.2

Academic Experience

- 2022 **Teaching Assistant**, Dynamical Systems (PH5500) at IIT Madras.
- 2021 **Lab Instructor**, Laboratory for Synthesis and characterization of Functional Materials (PH5330) at IIT Madras.
- 2020 **Lab Instructor**, Engineering Physics Lab-I (EP3190) at IIT Madras.
- 2019 **Teaching Assistant**, Quantum Computation and Quantum Information (PH5840) at IIT Madras.
- Teaching Assistant**, Physics II (PH1020) at IIT Madras.
- 2018 **Teaching Assistant**, Physics I (PH1010) at IIT Madras.

Skills

- Programming/Coding **Python, Julia, Fortran95, C, MATLAB, Wolfram Mathematica**
- Typography **LaTeX, Beamer, Markdown, MS Word.**
- Languages **English, Telugu.**

Research interests

- Employing information theoretic methods to understand the dynamics of quantum many-body systems.

Specific interests-1: Quantum information scrambling and chaos in many-body quantum systems, quantum algorithms for quantifying scrambling, quantum state tomography, quantum sensing and metrology, Komogorov-Arnold-Mosel (KAM) stability studies of many-body quantum integrable systems.

Research Publications

Journal Articles

- 1 N. D. Varikuti, "Scrambling in a non-kam system: Coarser versus finer time scales," *forthcoming*, 2023.
- 2 N. D. Varikuti, A. Sahu, A. Lakshminarayan, and V. Madhok, "Probing dynamical sensitivity of a non-kam system through out-of-time-order correlators," *arXiv preprint arXiv:2306.04209*, 2023.
- 3 N. D. Varikuti, A. Sahu, V. Madhok, and A. Lakshminarayan, "Non-kam sensors for quantum metrology," *forthcoming*, 2023.
- 4 N. D. Varikuti and V. Madhok, "Out-of-time ordered correlators in kicked coupled tops and the role of conserved quantities in information scrambling," *arXiv preprint arXiv:2201.05789*, 2022.
- 5 A. Sahu, N. D. Varikuti, and V. Madhok, "Quantum tomography under perturbed hamiltonian evolution and scrambling of errors—a quantum signature of chaos," *arXiv preprint arXiv:2211.11221*, 2022.
- 6 S. Pg, N. D. Varikuti, and V. Madhok, "Exponential speedup in measuring out-of-time-ordered correlators and gate fidelity with a single bit of quantum information," *Physics Letters A*, vol. 397, p. 127 257, 2021.

Conferences attended

- Feb, 2023 **Quantum Information Processing 2023** @ Ghent University, Belgium.
- Jan, 2023 **Progress in Quantum Science and Technologies** @ IIT Madras, India.
- Dec, 2022 **Conference on Nonlinear Systems and Dynamics** @ IISER Pune, India.
- Oct, 2021 **Probing Complex Quantum Dynamics through Out-of-time-ordered Correlators**, Virtual-cum-In person hybrid workshop @ Max Planck Institute.
- Dec, 2020 **Quantum Foundations, Technology and Applications 2020** @ IISER Mohali, India.
- Nov, 2020 **Q-Turn 2020**, international quantum information workshop series, Attended virtually.
- June, 2020 **6TH DYNAMICS DAYS CENTRAL ASIA**, Online Conference @ Nur-Sultan, Kazakhstan.
- Feb, 2020 **Indo-German Workshop on Quantum Science and Technologies 2020** @ IIT Madras, India.
- Nov, 2019 **THERMALIZATION, MANY BODY LOCALIZATION AND HYDRODYNAMICS** @ ICTS-TIFR, Bangalore, India.
- June, 2019 **BANGALORE SCHOOL ON STATISTICAL PHYSICS – X** @ ICTS-TIFR, Bangalore, India.

References

Available on Request