QuanTalks

IISc Quantum Technology Initiative (IQTI) Seminar Series

Title: **Blueprint for a scalable photonic fault-tolerant quantum computer.**

Speaker: **Dr. Priya J Nadkarni,** Quantum error correction researcher at Xanadu, Toronto, Canada (former M.Sc. and Ph.D. Engineering student at the Indian Institute of Science (IISc), Bengaluru.)
Email: priya@alum.iisc.ac.in

Date &Time: **Friday, 23rd December 2022 at 2.30 PM (IST)**

Venue: **Physics Department Auditorium, IISc**

Meeting Link: Click here to join the webinar

Abstract: Xanadu's proposal for a scalable and fault-tolerant photonic quantum computer using static linear optics. Central to the architecture are Gottesman-Kitaev-Pre skill bosonic qubits and squeezed states of light, stitched together into a qubit cluster state with one time and two spatial dimensions. This proposal for generating and manipulating a 3D resource state for fault-tolerant, measurement-based quantum computation combines state-of-the-art proposals for the preparation of bosonic qubits with the strengths of continuous-variable quantum computation performed using easy-to-generate squeezed states. Moreover, the architecture is based on modular, easy-to-network integrated photonic chips, opening the door to scalable fabrication and operation.

Biography: Priya J Nadkarni is a quantum error correction researcher at Xanadu, designing decoders tailored to fault-tolerant photonic quantum computers based on bosonic qubits. Previously, Priya completed M.Sc. and Ph.D. in Engineering at the Indian Institute of Science (IISc), Bengaluru, with a focus on entanglement-assisted additive qudit stabilizer codes and quantum distributed storage networks. She also received B.E. in electronics and communication engineering from the BMS College of Engineering, Bengaluru. Her research interests include quantum error correction codes, fault-tolerant quantum computation, quantum circuit architectures, quantum algorithms, and quantum communication.

Her Ph.D. work was presented at 7 top-tier conferences and has led to 9 journal publications in top-tier journals. She has received the IEEE-IISc Outstanding Officer Award and IEEE Bangalore Section's "Best Researcher Award – IISc. She has received the IEEE-IISc Outstanding Officer Award and IEEE Bangalore Section's "Best Researcher Award - IISc". She has been the Chair of the IEEE-IISc Com Soc Student Chapter, Secretary of the IEEE-IISc WISE affinity group, and Corresponding Secretary of the IEEE-IISc HKN Chapter.