Sriram Gopalakrishnan

Email: Personal | Waterloo | IITM
Web: Homepage | Google Scholar

EDUCATION

- **University of Waterloo** — Waterloo, Canada
  Graduate studies in Physics & Quantum Information — September 2020 - present
  Advisors: Beni Yoshida, Tim Hsieh
  Affiliations: Perimeter Institute, Institute of Quantum Computing

- **IIT Madras** — Chennai, India
  B.Tech. in Engineering Physics — Aug 2016 - May 2020
  Advisor: Uday Khankhoje
  Affiliations: Physics, Electrical Engineering
  Thesis: Vector 3D FEM for electromagnetic scattering [pdf]

PUBLICATIONS

- **Ring-Resonator-Based Coupling Architecture for Enhanced Connectivity in a Multiqubit Network**
  Sumeru Hazra, Anirban Bhattacharjee, Madhavi Chand, Kishor Salunkhe, **SG**, Meghan Patankar, R Vijay
  Physical Review Applied (2021) [doi] [pdf] (*Nature* "In Brief" [doi])

- **Landau Quantization of a circular Quantum Dot using the BenDaniel-Duke boundary condition**
  SG, Sayak Biswas, Shivam Handa
  Superlattices and Microstructures (2020) [doi] [pdf]

PAST EMPLOYMENT

- **Tata Institute of Fundamental Research (TIFR)** — Mumbai, India
  Superconducting Qubits — May - Jun 2019
  Advisor: Rajamani Vijayaraghavan — QuMaC Lab
  - Optimized the design of a novel ring resonator for maximal inter-qubit coupling
  - Awarded *Best Project* in Condensed Matter Physics [slides]

- **Homi Bhabha Center for Science Education** — Mumbai, India
  Quantum Dots and quantum many-body theory — Dec 2018 - Dec 2019
  Advisor: Praveen Pathak
  - Examined the effect of a modified boundary condition on the energy levels of a semiconducting QD
  - Studied variational approaches to solving many-electron systems, including Hartree-Fock and DFT

PROJECTS

- **Quantum Algorithm for Gibbs Sampling** — May - Jul 2021
  QIC823: Quantum Algorithms
  - Studied an efficient quantum algorithm [ref] for gibbs state preparation [slides] [report]

- **The 2D Hidden Linear Function problem** — Sep - Dec 2020
  QIC710: Intro to QIP
  - Studied a constant depth 2D quantum circuit [ref] with a provable quantum advantage [slides]

- **Constrained Optimization in CVX** Jan - Apr 2019
  EE5121: Convex Optimization
  - Used the CVX module in MATLAB to solve practically relevant optimization problems
- **The Tent Map** Jan - Apr 2019
  PH5500: Dynamical Systems
  - Studied the periodicity and chaos of Tent Maps numerically, & uses in image encryption [slides] [report]
- **Quantum capacity of channels with small environment** Jan - Apr 2019
  PH5842: Advanced Topics in QCQI
  - Studied an extremal qubit channel [ref] that has a simple closed form channel capacity [slides] [report]

SKILLS

- **Programming Languages**: C++, Python
- **Scientific Packages**: MATLAB, Mathematica, LaTeX, COMSOL

COURSEWORK

- **Physics (undergrad)**: Classical Mechanics, Electrodynamics, Statistical Physics, Quantum Mechanics
- **Physics (grad)**: Quantum Information, Dynamical Systems, Stochastic Processes, Advanced Stat Mech
- **Mathematics**: Multi-variable Calculus, Probability, Convex Optimization
- **Electrical Engineering**: Signal Processing, Circuit theory, Analog Systems, Communication Systems

HONORS/AWARDS

- VSRP Scholar, Tata Institute of Fundamental Research 2019
- NIUS Scholar, Homi Bhabha Center for Science Education 2018
- KVPY Fellow, DST, Government of India (*Rank: 291 of 50,000+ participants*) 2016

UNIVERSITY/COMMUNITY SERVICE

- **Department Legislator, Engineering Physics** Feb 2019 - Present
  - Organized an session to list a plethora of research internship opportunities relevant to the department
  - Member of the Student Legislative Council (SLC), addressing issues of general interest at IIT Madras
- **National Service Scheme, IIT Madras** Aug 2016 - Apr 2017
  - Taught mathematics to middle and high school students at Suyam Charitable Trust, Vyasarpadi
  - Participated in multiple collection drives within the IIT Madras campus