Saurabh Totey

(720) 648-2674 | SaurabhTotey@proton.me | SaurabhTotey.com | github.com/SaurabhTotey | linkedin.com/in/SaurabhTotey | U.S. Citizen

Education

Tufts University Sept. 2025 – May 2027 (expected)
M.S., Computer Science *Medford, MA*

- Graduate research in quantum algorithms and complexity; coursework in quantum computation and information theory
- Teaching Assistant, Quantum Computer Science (CS 162), Fall 2026

University of Colorado Boulder Aug. 2019 – May 2023
B.S., Engineering Physics and Computer Science; Minors in Mathematics, Quantum Engineering, Philosophy *Boulder, CO*

- GPA 3.93/4.0, Summa Cum Laude; Quantum Scholars Fellow; Sewall Esteemed Scholar Award

Quantum Research

Tufts University — Quantum Computing Theory Sept. 2025 – Present
Graduate Researcher *Medford, MA*

- Developing quasi-polynomial-time classical algorithms that approximate partition functions of interacting bosonic (cross-Kerr) Hamiltonians via Barvinok interpolation and zero-freeness.
- Derived an $m^{O(k)}$-time algorithm for the k-th Taylor coefficient of $\log Z$, validated symbolically and numerically.
- Gave expository group talks on learning quantum Gibbs states and on the computational transition at the uniqueness threshold.

University of Colorado Boulder — Combes Theory Group May 2022 – Jan. 2024
Undergraduate Researcher *Boulder, CO*

- Benchmarked random bosonic rotation codes against cat, binomial, and hexagonal GKP codes under loss and dephasing noise, using numerical simulations in Python and Julia.

Publications

- S. Totey, A. Kyle, S. Liu, P. J. Barge, N. Lordi, J. Combes, "The performance of random bosonic rotation codes," arXiv:2311.16089 (2023).
- Classical approximation of partition functions of interacting bosonic Hamiltonians, with S. Mehraban and collaborators (in preparation).

Engineering Experience

Amazon Web Services — Amazon Connect July 2023 – Aug. 2025
Software Development Engineer *Seattle, WA*

- Eliminated a 20+-hour monthly manual deployment process by fully automating infrastructure updates: split the pipeline into per-availability-zone stages and added automatic, alarm-gated host replacement (AWS Step Functions, CloudFormation). Also sharply reduced compliance (FedRAMP) findings for outdated machine images.
- Enabled that automation by reallocating subnets in order to expand the service's IP address space so old and new hosts could run side by side (saving $\sim$ 2 hours of on-call time per bad deployment), and helped migrate its infrastructure code from a deprecated internal framework to AWS CDK (TypeScript).
- Made call-recording delivery crash-resilient: recordings from crashed hosts now upload automatically, replacing $\sim$1.5-hour manual on-call recoveries (several per week after bad deployments) that delayed customers' recordings by up to a week and occasionally lost them (Java).
- Enabled supervisor barge-in for government contact centers by launching feature in AWS GovCloud (US), coordinating across Amazon Connect teams; handled U.S.-citizen-only (ITAR) engineering and on-call.

Amazon Devices — Alexa May 2022 – Aug. 2022
Software Development Intern *Boston, MA*

- Built LED-based timer progress indication for screenless Alexa devices; owned requirements and documentation across several distributed teams and demoed the shipped feature.

PhET Interactive Simulations, CU Boulder May 2018 – Aug. 2021
Software Developer *Boulder, CO*

- Built large portions of four browser-based science and math simulations in JavaScript, including Blackbody Spectrum, Curve Fitting, and Number Line Distance; refactored shared library code and fixed memory leaks.

Skills

Quantum: bosonic error correction (cat, binomial, GKP codes); open quantum systems and Gibbs sampling; partition-function algorithms and zero-freeness; Hamiltonian complexity; QuTiP
Programming: Python, Julia, Java, TypeScript, Rust, Mathematica
Cloud & Infra: AWS (CDK, CloudFormation, Step Functions, EC2 Auto Scaling, GovCloud), CI/CD pipelines, Nix
Spoken: English (native), Spanish (fluent), French (intermediate)