

DANIEL HARRINGTON

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EDUCATION

B.Sc. Physics and Mathematics, Tufts University (in progress–May 2026)

Relevant Coursework: Quantum Mech. I, Real Analysis I, Linear Algebra, Mathematical Aspects of Data Analysis, Calculus I-III, Electronics, Differential Equations. GPA 4.0/4.0, Dean's List Honors.

Spring 2024 Coursework: Quantum Mech. II, Real Analysis II, Thermal Physics, Convex Optimization

EXPERIENCE

Tufts Nanophotonics Group (PI Aseema Mohanty) – Research Assistant (Fall 2023—)

- Developing techniques to control electric field distribution in an integrated multimode waveguide through mode superposition modulation via microring resonators
- Simulation/design of photonic circuits, analytical modeling of mode propagation
- Planned application to addressable excitation of epitaxially grown quantum dots and single neuron activation

National Institute of Standards and Technology – Undergraduate Research Fellow (Summer 2023)

- Investigated passivation effects of polymers on MoS₂ monolayers for FET photodetection applications
- Characterized polymer effects via Raman, PL, and THz spectroscopy (time-resolved/time-domain)
- Operation and alignment of Class 4 lasers and optics to improve SNR for THz setup
- Developed spatial filtering algorithm to remove defect sites from PL spectra images allowing for uniform sample comparison and identification of polymer-induced doping effects
- Data analysis/presentation for colloquium, helped write and prepare publication (under review)

Tufts SEDS Club – Radio Telescope Team Lead, Board Member (Fall 2022—)

- Lead project to develop and construct a 3-meter educational radio telescope for public use
- Develop full-stack software for user observation scheduling, data analysis/storage, dish rotator control

PUBLICATIONS

C.K. McGinn, D.M. Harrington, E. Heilweil, and C.A. Hacker. Spectroscopic Analysis of Polymer and Monolayer MoS₂ Interfaces for Photodetection Applications. (*Under Review*)

PROJECTS

See Portfolio Site

- **Bures-Wasserstein (BW) Learning for Quantum State Tomography** – Comparison of compressed sensing and deep learning QST methods to novel application of BW barycenters for matrix recovery
- **Spatial Light Modulator** – LCD-based computer-controlled SLM for optics demonstrations
- **Muon Detector** – SiPM-based muon counter with signal amplification and detection circuit

SKILLS

Software: Python (Pandas, numpy, matplotlib), C/C++, JS, CAD (Fusion360), Mathematica, FDTD (pymeeep), FIMMWAVE, LabView, Git, Office, LaTeX, Linux/MacOS/Windows

Hardware: Electronics, microcontrollers, tabletop optical components, lock-in amplifiers, oscilloscopes