# Curriculum Vitae

Owen Rafferty

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## Research Interests

Superconducting devices, quantum information

## Education

**University of Chicago** Fall 2021–Spring 2022
Pritzker School of Molecular Engineering Ph.D. Program

**University of Wisconsin–Madison** Fall 2017–Spring 2021
B.S. Physics with Honors
Advisor: Robert McDermott
Thesis: *Resonant absorption and radiation in transmon qubits*

## Research Experience

**Modeling decoherence in transmon qubits** Fall 2019–Summer 2021
UW–Madison Department of Physics, Advisor: Robert McDermott

- Developed a model to explain the coupling of Cooper pair-breaking photons to a transmon qubit's Josephson junction, partially explaining the universally observed high background density of Bogoliubov quasiparticles in transmons and similar devices

**Single-molecule spectroscopy time series analysis and simulation** Fall 2018–Summer 2019
UW–Madison Department of Neuroscience, Advisor: Baron Chanda

- Developed a GUI to accompany a single-molecule state trajectory idealization algorithm and wrote auxiliary routines for dwell time analysis
- Developed a GUI to accompany single-molecule trajectory simulation code and wrote supplementary functions to simulate photophysics

## Publications

1. C. H. Liu, A. Ballard, D. Olaya, D. R. Schmidt, J. Biesecker, T. Lucas, J. Ullom, S. Patel, **O. Rafferty**, A. Opremcak, K. Dodge, V. Iaia, T. McBroom, J. L. DuBois, P. F. Hopkins, S. P. Benz, B. L. T. Plourde, and R. McDermott, "Single Flux Quantum-Based Digital Control of Superconducting Qubits in a Multi-Chip Module", Phys. Rev. Lett. **132**, 017001 (2024)
2. C. H. Liu, D. C. Harrison, S. Patel, C. D. Wilen, **O. Rafferty**, A. Shearrow, A. Ballard, V. Iaia, J. Ku, B. L. T. Plourde, and R. McDermott, "Quasiparticle Poisoning of Superconducting Qubits from Resonant Absorption of Pair-breaking Photons", PRX Quantum **4**, 030310 (2023).
3. **O. Rafferty**, S. Patel, C. H. Liu, S. Abdullah, C. D. Wilen, D. C. Harrison, and R. McDermott, "Spurious Antenna Modes of the Transmon Qubit", arXiv:2103.06803 (2021).

## Honors and Awards

Hilldale Undergraduate Research Fellowship, UW–Madison 2020–2021

## Affiliations

American Physical Society

## Contributed Talks

Terahertz Radiation Mode of the Transmon Qubit

- UW–Madison Undergraduate Research Symposium, 2021

## Contributed Posters

Modeling the Antenna Mode of the Transmon Qubit

- APS March Meeting, 2021

## Miscellaneous

**UW–Madison**

- Grader, Physics 531: Introduction to Quantum Mechanics, Fall 2019, Fall 2020