

Victoria A. Norman

Postdoctoral Researcher · Cavendish Laboratory · University of Cambridge
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EDUCATION

University of California, Davis

Ph.D. in Physics

Advisor: Marina Radulaski

M.S. in Physics

Advisor: Nicholas Curro

2017 - 2024

University of Chicago

Honors B.A. in Physics

Advisor: David Schuster

2012-2016

Dean's List (all years)

RESEARCH EXPERIENCE

Postdoctoral Researcher

February 2025 - Present

Quantum Optical Materials Systems group, Cavendish Laboratory, University of Cambridge

- Studies of molecular quantum emitters and qubit candidates on functionalized substrates.
- Scanning NV magnetometry studies of low-dimensional magnetism, transport properties.

Graduate Student Researcher

May 2019 - December 2024

Radulaski Lab, Department of Electrical and Computer Engineering, University of California, Davis

- *PhD Thesis:* Cryogenic Spectroscopy of Silicon Carbide Color Center Photonic Devices
- Measured the first NV center-integrated 4H-SiC nanostructures including microring and racetrack resonators, and nanopillars.
- Built a scanning 4F microscope and a custom graphical user interface in python to control experiments. Integrated superconducting single photon detectors in an optical cryostat in an industry partnership.
- Simulated open quantum systems of quantum optics systems in QuTIP and on NISQ-era superconducting and trapped ion quantum processors.

Graduate Student Researcher

January 2018 - December 2024

Curro Lab, Department of Physics and Astronomy, University of California, Davis

- Solid state NMR spectroscopy in high magnetic field and at cryogenic temperatures under uniaxial strain.
- Optically-detected magnetic resonance instrumentation for measurements under pressure using NV centers in diamond.

Post-Baccalaureate Fellow

July 2016 - July 2017

Advanced Light Source, Lawrence Berkeley National Lab

- Performed measurements, analysis on a variety of materials for an X-ray scattering beamline. Designed and fabricated custom sample stages for facility users.

Undergraduate Research Assistant

October 2013 - June 2016

Schuster Lab, Department of Physics, University of Chicago

- *Undergraduate Physics Honors Thesis:* Improving Qubit Quality Factors in 3D Transmon Qubits With Exotic Materials

TEACHING EXPERIENCE

Associate Instructor, UC Davis

ECE 289L Quantum Information Technologies:

S2021

- A graduate-level topics course with significant active learning components geared towards engineering students to increase quantum information literacy and interdisciplinary thinking.
- Assisted with initial course design.

Lead TA, UC Davis

AST 10L Astronomy Lab:

F2019

- Lectured three sections a week on introductory ground-based astronomy techniques. Led and organized a team of 5 teaching assistants. Wrote and administered midterm and final.

Graduate Teaching Assistant, UC Davis

- PHY 9 Series: Introductory physics series for physical sciences majors and engineers. S2024
- PHY 104*: Mathematical Methods of Physics S2024
- PHY 108*: Optics S2022
- ECE 289L^{*†}: Quantum Information Technologies W2020
- PHY 7 Series[†]: Introductory physics series for life sciences majors: 2017 - 2020

* indicates upper division or graduate courses

† indicates courses with significant active learning components

DIVERSITY, EQUITY, INCLUSION, AND SERVICE

Cavendish Research Staff Committee

2025-Present

- *Treasurer*; a regular committee representing the interests of postdocs and other research staff working at the Cavendish Lab, University of Cambridge; reports to the Environment & Community Committee.

Quantum Journal Club

2019-2022

- *Founder and head organizer*; a monthly meeting with dozens of undergrad and grad students, postdocs, and faculty featuring two main speakers from either academia or industry; was eventually spun off into an interdisciplinary QUIST Colloquium series in 2022.

Incoming Physics Grad Student Tutorial

2022-Present

- *Founder and head organizer*; a tutorial series on physics and mathematical topics relevant to but not always taught in first year coursework. Founded to address education gaps that may exist for non-traditional incoming graduate students.

Mentorship

2017-present

- Directly mentored 10 undergraduates on both experimental and computational projects, 3 junior Ph.D. students, and 2 masters students as a part of the Radulaski and Curro research groups. A list of students and their projects is available upon request. Planned and participated in outreach events to students at both high school and university campuses to encourage college matriculation in STEM subjects.

Diversity in Physics Group

2017-Present

- *Group member*; ran workshops on topics like applying to grad school and overcoming imposter syndrome geared towards under-represented communities. Co-wrote grants to APS for funding diversity initiatives at UC Davis including the TEAM-UP initiative.

UC Davis Graduate Organization of Physics Students

2018-2024

- *Founding member and committee member.* Additionally, a founding member of the UC Davis Physics and Astronomy grad student mentoring program

Conference for Undergraduate Women in Physics

2019

- *Organizing committee member;* booked speakers, organized sessions, and sat on panels about graduate student life, graduate school applications, and research experiences.

AWARDS

IBM Quantum Hackathon

July 2020

- Team Leader of California Division Winning Project. **Quid Pro Quo: A Quantum Optics Educational Simulation Package.**

Summer Graduate Student Researcher (GSR) Award

2020-2021.

- To support graduate research in engineering, computer sciences, and disciplines with engineering-related applications and methods.

Journal Publications

- [1] Sridhar Majety et al. “Wafer-scale integration of freestanding photonic devices with color centers in silicon carbide”. In: *npj Nanophotonics* 2.1 (2025), p. 3.
- [2] Brian Marinelli et al. “Photon blockade in a Tavis-Cummings system”. In: *Phys. Rev. Appl.* 24 (4 2025), p. 044103.
- [3] Victoria A Norman et al. “Sub-2 Kelvin characterization of nitrogen-vacancy centers in silicon carbide nanopillars”. In: *ACS photonics* 12.5 (2025), pp. 2604–2611.
- [4] Alex H Rubin et al. “Digital quantum simulation of cavity quantum electrodynamics: insights from superconducting and trapped ion quantum testbeds”. In: *Quantum Science and Technology* 10.4 (2025), p. 045057.
- [5] Victoria A. Norman et al. “Polariton creation in coupled cavity arrays with spectrally disordered emitters”. In: *Mat. Quant. Tech.* 4.2 (2024), p. 025401.
- [6] Marina Radulaski and Victoria A Norman. “Spin-Interaction Studies Take on a New Dimension”. In: *Physics* 16 (2023), p. 1.
- [7] Eli Baum et al. “Effect of emitters on quantum state transfer in coupled cavity arrays”. In: *Physical Review B* 105.19 (2022), p. 195429.
- [8] Sridhar Majety, Pranta Saha, Victoria A Norman, and Marina Radulaski. “Quantum information processing with integrated silicon carbide photonics”. In: *Journal of Applied Physics* 131.13 (2022), p. 130901.
- [9] Victoria A Norman and Marina Radulaski. “Quantum underpinnings of an all-photonic switch”. In: *Nature Physics* 18.10 (2022), pp. 1139–1140.
- [10] Sridhar Majety et al. “Quantum photonics in triangular-cross-section nanodevices in silicon carbide”. In: *Journal of Physics: Photonics* 3.3 (2021), p. 034008.
- [11] Victoria A Norman et al. “Novel color center platforms enabling fundamental scientific discovery”. In: *InfoMat* 3.8 (2021), pp. 869–890.
- [12] Dan Ye et al. “Preferred crystallographic orientation of cellulose in plant primary cell walls”. In: *Nature communications* 11.1 (2020), p. 4720.
- [13] Matthew T Murachver et al. “Indication of a twist-grain-boundary-twist-bend phase of flexible core bent-shape chiral dimers”. In: *Soft matter* 15.16 (2019), pp. 3283–3290.
- [14] Michael R Tuchband et al. “Distinct differences in the nanoscale behaviors of the twist–bend liquid crystal phase of a flexible linear trimer and homologous dimer”. In: *Proceedings of the National Academy of Sciences* 116.22 (2019), pp. 10698–10704.
- [15] Xin Song et al. “A Highly Crystalline Fused-Ring n-Type Small Molecule for Non-Fullerene Acceptor Based Organic Solar Cells and Field-Effect Transistors”. In: *Advanced Functional Materials* 28.35 (2018), p. 1802895.
- [16] Keely Pierzchalski, Jianshi Yu, Victoria Norman, and Maureen A Kane. “CrbpI regulates mammary retinoic acid homeostasis and the mammary microenvironment”. In: *The FASEB Journal* 27.5 (2013), pp. 1904–1916.

Invited Talks

- [1] Victoria A Norman. "Measurements of NIR quantum nanophotonics in the ICECAP system". In: *University of California, Davis Department of Physics and Astronomy Colloquium*. 2024.
- [2] Victoria A Norman. "Measurements of NV centers in 4H-SiC integrated in photonic devices below 2 K". In: *San Jose State University Department of Physics and Astronomy Seminar*. 2024.
- [3] Victoria A Norman. "Sub-2 Kelvin Characterization of Nitrogen-vacancy Centers in Silicon Carbide Nanopillars". In: *NYU Center for Quantum Phenomena Seminar*. 2024.
- [4] Victoria A Norman. "Scaling silicon carbide nanophotonics for quantum information applications". In: *UNSW Sydney*. 2023.
- [5] Victoria A Norman. "Silicon carbide as a scalable quantum information technology platform". In: *Molecular Foundry Annual User Meeting 2023*. Lawrence Berkeley National Lab, 2023.

Refereed Talks

- [1] Marina Krstic Marinkovic, Marina Radulaski, Victoria A Norman, and Tristan Adams. "Quantum photonic system modelling on NISQ devices". In: *Bulletin of the American Physical Society* 68 (2023).
- [2] Victoria A Norman. "Silicon carbide nanopillars with integrated NcVSi centers: A test case for an optical cryostat with a built-in superconducting single photon detector system". In: 2023.
- [3] Victoria A Norman, Sridhar Majety, Pranta Saha, and Marina Radulaski. "Integrated system of an optical cryostat and single-photon detectors for applications in near infrared spectroscopy of quantum emitters". In: *Bulletin of the American Physical Society* 68 (2023).
- [4] Victoria A Norman, Jesse Patton, Richard Scalettar, and Marina Radulaski. "All-photonic quantum simulators with spectrally disordered ensembles of emitters". In: *Quantum 2.0 Conference and Exhibition*. Optica Publishing Group, 2022, QTu3A.6.
- [5] Victoria A Norman, Jesse Patton, Richard Scalettar, and Marina Radulaski. "Multi-emitter cavity QED with color centers". In: *Bulletin of the American Physical Society* 66 (2021).
- [6] Victoria Norman. "Improving Qubit Quality Factors Through Exotic Materials". In: *Bulletin of the American Physical Society* 61 (2016).