

# Victoria A. Norman

Physics PhD Candidate · University of California Davis · ✉ vanorman@ucdavis.edu

🆔 0000-0002-7093-607X · 🔗 quantumnorman · 📖 Victoria A. Norman

## EDUCATION

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### University of California, Davis

2017 - Present

Ph.D. in Physics

*Advisor: Marina Radulaski*

M.S. in Physics

2018

*Advisor: Nicholas Curro*

### University of Chicago

2012-2016

B.A. in Physics (With Honors)

Dean's List (all years)

*Advisor: David Schuster*

## RESEARCH EXPERIENCE

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### Graduate Student Researcher

May 2019 - Present

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

- *Research focus:* Design and characterization of near-infrared color centers integrated nanophotonic devices for quantum information technologies
- Built a scanning 4F microscope and wrote a graphical user interface in python to control experiments. Integrated superconducting single photon detectors in an optical cryostat in an industry partnership
- Simulating open quantum systems of quantum optics systems in QuTIP and on NISQ-era superconducting and trapped ion quantum processors

### Graduate Student Researcher

January 2018 - Present

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

### Undergraduate Research Assistant

October 2013 - June 2016

Schuster Lab, Department of Physics, University of Chicago

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

## TEACHING EXPERIENCE

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Associate Instructor, UC Davis

- *ECE 289L Quantum Information Technologies*: Co-lectured and administrated a graduate-level topics course geared towards engineering students to increase quantum information literacy and interdisciplinary thinking.

### Lead TA, UC Davis

- *AST 10L Astronomy Lab*: Lectured three sections a week on introductory ground astronomy techniques. Led and organized a team of 5 teaching assistants to train students to set up and use manual bucket telescopes. Wrote and administered midterm and final.

### Graduate Teaching Assistant, UC Davis

- *PHY 7 Series*: introductory physics series for life sciences majors, flipped classroom primarily based around active learning elements.
- *ECE 289L Quantum Information Technologies*: TA for the first ever version of this course being taught.
- *PHY 108 Optics*: Upper division classical optics course and lab.

## DIVERSITY, EQUITY, AND INCLUSION

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- **Diversity in Physics**: *Group member*. Helped run workshops on applying to grad school geared towards a variety of underrepresented groups in physics. Helped run overcoming imposter syndrome workshops and have helped write grants to APS for funding diversity initiatives at UC Davis including the TEAM-UP initiative.
- **Conference for Undergraduate Women in Physics**: *Organizing committee member 2019*; helped find speakers, organized sessions, and sat on panels.
- **Incoming Physics Grad Student Tutorial**: *Founder*. A tutorial series on physics and mathematical topics relevant to but not always taught in first year coursework.
- **Physics and Astronomy Department REU**: *Program graduate assistant 2022*. Reading and ranking applications and mentoring students in the program.

## SERVICE

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- **Mentorship and Outreach**: Founding member of the UC Davis Physics and Astronomy grad student mentoring program. Mentored several undergraduates, junior Ph.D. students, and masters students as a part of research groups. Planned and participated in outreach events to students at both high school and university campuses to encourage college matriculation in STEM subjects.
- **UC Davis Graduate Organization of Physics Students**: Founding member; Community Representative 2018-2023.
- **Quantum Journal Club**: Founder and head organizer of a monthly meeting between dozens of undergrad and grad students, postdocs, and faculty featuring two main speakers from either academia or industry.

- **Astronomy On Tap speaker (2022):** Monthly science communication seminar series geared towards astronomy. 50 minute talk on satellite distributed quantum key distribution, "Unbreakable Quantum Codes... From Space?".

## AWARDS

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- **IBM Quantum Hackathon:** Team Leader of California Division Winning Project. July 2020. **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] Marina Radulaski and Victoria A Norman. “Spin-Interaction Studies Take on a New Dimension”. In: *Physics* 16 (2023), p. 1.
- [2] Eli Baum et al. “Effect of emitters on quantum state transfer in coupled cavity arrays”. In: *Physical Review B* 105.19 (2022), p. 195429.
- [3] 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.
- [4] Victoria A Norman and Marina Radulaski. “Quantum underpinnings of an all-photonic switch”. In: *Nature Physics* 18.10 (2022), pp. 1139–1140.
- [5] Sridhar Majety et al. “Quantum photonics in triangular-cross-section nanodevices in silicon carbide”. In: *Journal of Physics: Photonics* 3.3 (2021), p. 034008.
- [6] Victoria A Norman, Jesse Patton, Richard T Scalettar, and Marina Radulaski. “All-photonic quantum simulators with spectrally disordered emitters”. In: *arXiv:2112.15469* (2021).
- [7] Victoria A Norman et al. “Novel color center platforms enabling fundamental scientific discovery”. In: *InfoMat* 3.8 (2021), pp. 869–890.
- [8] Dan Ye et al. “Preferred crystallographic orientation of cellulose in plant primary cell walls”. In: *Nature communications* 11.1 (2020), p. 4720.
- [9] 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.
- [10] 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.
- [11] 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.
- [12] 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. “Scaling silicon carbide nanophotonics for quantum information applications”. In: *Rogge Group Meeting, UNSW Sydney*. 2023.
- [3] 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] Majety Norman Victoria A. “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 Norman, Jesse Patton, Richard Scalettar, and Marina Radulaski. “Polariton creation in photonic quantum simulators”. In: *Bulletin of the American Physical Society* 67 (2022).
- [6] Victoria Norman, Jesse Patton, Richard Scalettar, and Marina Radulaski. “Multi-emitter cavity QED with color centers”. In: *Bulletin of the American Physical Society* 66 (2021).
- [7] Victoria Norman. “Improving Qubit Quality Factors Through Exotic Materials”. In: *Bulletin of the American Physical Society* 61 (2016).