

LOGAN BISHOP-VAN HORN

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EDUCATION

Stanford University

December 2018

M.S. Physics

Advisor: Prof. Kathryn A. Moler

Research focus: Real-space and time-resolved magnetic measurements of unconventional superconductors and superconducting devices on micron length scales.

Clark University

December 2016

B.A. Physics & Mathematics, *summa cum laude*, highest honors in Physics

Advisor: Prof. Charles C. Agosta

Honors Thesis: *Investigating the FFLO state in the organic superconductor λ -(BETS)₂GaCl₄*

RESEARCH EXPERIENCE

Graduate Research Assistant, Moler Group

September 2017 – December 2018, January 2021 –

Stanford University Department of Physics

Stanford, CA

- \diamond Constructed two new cryogen-free scanning Superconducting QUantum Interference Device (SQUID) microscope systems: one capable of measuring samples at temperatures from 3 K to over 100 K, the other capable of measuring samples below 100 mK.
- \diamond Wrote a comprehensive scanning SQUID Python package, with an emphasis on modularity, measurement automation/throughput, and robust logging of experiment metadata, to replace the lab's legacy MATLAB measurement and control software.
- \diamond Implemented low-cost, reliable FPGA-based digital flux feedback for readout of scanning SQUID microscopes, replacing legacy analog electronics.

Research Associate

January 2019 –

Quantum Circuits, Inc.

New Haven, CT

- \diamond Characterization and simulation of superconducting devices for modular quantum information processing with microwave photons.
- \diamond Software development for instrument control, measurement automation, data analysis, and quantum device simulation.

Cornell Center for Materials Research REU

May 2016 – August 2016

Cornell University Department of Physics

Ithaca, NY

- \diamond Developed new tools in Python for performing micromagnetic simulations of spin transfer torque-driven ferromagnetic resonance (ST-FMR), under the advisement of Prof. Dan Ralph.

Undergraduate Researcher

June 2014 – December 2016

Clark University Department of Physics

Worcester, MA

- \diamond Worked with Prof. Charles Agosta and other undergraduate students to set up a tunnel diode oscillator (TDO) system for research into unconventional superconductors in pulsed magnetic fields.
- \diamond Traveled to the NHMFL Pulsed Field User Facility at LANL and to the NHMFL DC Field Facility at FSU to conduct TDO measurements of quasi-2D organic superconductors in high magnetic fields. Worked to develop a new probe for angle-dependent pulsed field TDO studies.

TEACHING & MENTORSHIP EXPERIENCE

CAMPARE Graduate Student Mentor

June 2018 – August 2018

Stanford University Department of Physics

Stanford, CA

- ◇ Mentored a summer undergraduate researcher as part of CAMPARE, a statewide diversity-oriented undergraduate research program.

Teaching Assistant, Physics 43

April 2018 – June 2018

Stanford University Department of Physics

Stanford, CA

- ◇ Teaching assistant for Physics 43 (introductory electricity & magnetism for all non-physics STEM undergraduates at Stanford). Led two weekly discussion sections (~ 20 students each), and held weekly office and tutoring hours.

TECHNICAL SKILLS

Programming/Data Analysis

Python, Git/GitHub, QuTiP, MATLAB, SPICE, mumax3

Laboratory Experience

Superconducting electronics (dc to microwave),
scanned probe microscopy, cryogenics,
cryogen-free dilution refrigerators, spintronics,
rf measurement in pulsed/dc magnetic fields

HONORS & AWARDS

NSF GRFP Honorable Mention (2017)

Albert C. Erickson Award (Clark University undergraduate physics award, 2016)

Clark University Dean's List (all semesters)

PRESENTATIONS & PUBLICATIONS

- ◇ Irene P. Zhang, Johanna C. Palmstrom, Hilary Noad, **Logan Bishop-Van Horn**, Yusuke Iguchi, Zheng Cui, John R. Kirtley, Ian R. Fisher, and Kathryn A. Moler, *Imaging anisotropic vortex dynamics in FeSe*. Phys. Rev. B 100, 024514 (2019).
- ◇ **Logan Bishop-Van Horn**, *et al.*, Cryogen-free variable temperature scanning SQUID microscope, APS March Meeting 2019, Boston.
- ◇ **Logan Bishop-Van Horn**, Zheng Cui, John R. Kirtley, and Kathryn A. Moler, *Cryogen-free variable temperature scanning SQUID microscope*. Review of Scientific Instruments 90, 063705 (2019).
- ◇ **Logan Bishop-Van Horn**, *et al.*, New details in the superconducting phase diagram of λ -(BETS)₂GaCl₄ further evidence of a FFLO phase, APS March Meeting 2017, New Orleans.
- ◇ Agosta, C.C., **Bishop-Van Horn, L.** & Newman, M. *The Signature of Inhomogeneous Superconductivity*. J. Low Temp. Phys. (2016).