Arielle Little

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EDUCATION

Ph.D.	**University of California, Berkeley** Expected March 2020	Experimental Condensed Matter Physics Advisor: Joseph Orenstein Dissertation: "Symmetry-Sensitive Probes of Quantum Antiferromagnets"
M.A	**University of California, Berkeley** 2013-2015	Physics
B.A.	**University of California, Berkeley** 2007-2011	B.A., Physics and B.A., Geophysics Minor in Creative Writing

RESEARCH EXPERIENCE

Graduate Student Researcher—Lawrence Berkeley National Lab 2015-present
Advisor: Joseph Orenstein

- Designed and performed optical experiments, ranging in energy from the terahertz to the x-ray.
- Developed a scanning birefringence microscopy technique to study resistance-switching magnetic materials.
- Led the procurement and implementation of a high field magnet system and two low-temperature cryostats
- Worked in close collaboration with scientists across multiple institutions.

Visiting Researcher—Max Planck Institute for the Chemical Physics of Solids, Dresden, Germany June 2016
Host: Clifford Hicks, Andrew MacKenzie

- Visited MPI to learn operation of uniaxial strain devices and develop implementation for optical cryostats.

Junior Specialist Researcher—CERN, Geneva, Switzerland 2011- 2013
Advisor: Joel Fajans, Antihydrogen Laser Physics Apparatus (ALPHA) Collaboration

- Worked with a large international team on the design, commissioning, and operation of an experiment at CERN's Antiproton Decelerator to trap, detect, and perform spectroscopy on antimatter. Based in Geneva for approximately one year.

RESEARCH SKILLS

LABORATORY

- Optical techniques including terahertz spectroscopy, ultrafast pump-probe, magneto-optical microscopy.
- Extensive experience with vacuum, electronics, writing LabView software for data acquisition.
- Worked with staff scientists to take X-ray data during beamtime shifts at the Advanced Light Source.
- Basic machine shop skills and 3D printer operation.

COMPUTATION

- Python for data analysis, LabView, Autodesk Fusion, some experience with C++/ROOT
- CDIPS Data Science Workshop, Project: Election prediction with a neural network (July-August 2017)

PUBLICATIONS AND PRESENTATIONS

Publications

1. **A. Little*,** C. Lee*, C. John, S. Doyle, E. Maniv, N.L. Nair, W. Chen, D. Rees, J.W.F. Venderbos, R. Fernandes, J.G. Analytis "Observation of three-state Observation of three-state nematicity in the triangular lattice antiferromagnet $Fe_{1/3}NbS_2$" Under review. Preprint at: https://arxiv.org/abs/1908.00657 (2019)

2. L. Wu*, **A. Little***, E. Aldape*, D. Rees, E. Thewalt, P. Lampen-Kelley, A. Banerjee, C.A. Bridges, J-Q. Yan, D. Boone, S. Patankar, D. Goldhaber-Gordon, D. Mandrus, S.E. Nagler, E. Altman, J. Orenstein. "Field evolution of magnons in α -$RuCl_3$ by high-resolution terahertz spectroscopy." **Editors' Suggestion Award**, *Phys. Rev. B* 98, 094425 (2018)

3. **A. Little***, L. Wu* P. Lampen-Kelley, A. Banerjee, S. Patankar, D. Rees, C.A. Bridges, J-Q Yan, D. Mandrus, S.E. Nagler, J. Orenstein "Antiferromagnetic Resonance and terahertz continuum in α -$RuCl_3$" *Phys. Rev. Lett.* 119 (22), 227201 (2017)

4. E. Thewalt, I.M. Hayes, J.P. Hinton, **A. Little**, S. Patankar, Liang Wu, T. Helm, C. V. Stan, N. Tamura, J.G. Analytis, J. Orenstein. "Imaging nematic order in optimally doped BaFe2(As,P)$_2$" *Phys. Rev. Lett.* 121 (2), 021001 (2018)

5. L. Wu, S. Pantankar, T. Morimoto, N.L. Nair, E. Thewalt, **A. Little**, J.G. Analytis, J.E. Moor, J. Orenstein. "Giant anisotropic nonlinear optical response in transition metal monopnictide Weyl semimetals" *Nature Physics*, 13, 350-355 (2017).

6. C. Amole, … **A. Little,** et al. (ALPHA Collaboration). "An experimental limit on the charge of antihydrogen" *Nature Communications* 5, 2955 (2015)

7. C. Amole… **A. Little**, et al. (ALPHA Collaboration) "Resonant quantum transitions in trapped antihydrogen atoms" *Nature* 483, 439 (2012)

Contributed talks

1. Moore Foundation EPiQs Program Postdoctoral Symposium, Beverley, MA 2019
"Imaging Potts-Nematic Order in $Fe_{1/3}NbS_2$"

2. APS March Meeting, Boston, MA 2019
"Magneto-Optical Kerr Effect microscopy on the intercalated transition metal dichalcogenides Fe_xTaS_2"

3. APS March Meeting, Los Angeles, CA 2018
"Antiferromagnetic Resonance and Terahertz Continuum in α -$RuCl_3$"

4. APS March Meeting, New Orleans, LA 2017
"Low Energy Spectrum of Proximate Kitaev Spin Liquid α -$RuCl_3$ by Terahertz Spectroscopy"

Invited talks

1. Bay Area Wonderfest, Alameda, CA 2019
"The Wonderful World of Quantum Materials"—Popular science lecture

2. UC Berkeley Quantum Materials Seminar 2018
"Surfing the Spin Waves in α-$RuCl_3$"

3. Max Planck Institute for the Chemical Physics of Solids 2016
"Optics of Quantum Materials"

WORKSHOPS ATTENDED

Novel Optical and Photonic Materials: Design and Fabrication, Stanford, CA 2020

Gordon and Betty Moore Foundation EPiQs Postdoctoral Symposium, Beverley, MA 2019

Gordon Research Conference on Correlated Electron Systems, South Hadley, MA 2018
Workshop on advances in Non-Fermi liquids, Berkeley, CA 2018

Canadian Institute for Advanced Research (CIFAR) Quantum Materials Summer School, Toronto, Canada 2016

AWARDS

Berkeley Connect Fellowship Award, UC Berkeley 2015

Outstanding Graduate Student Instructor Award 2015

TEACHING EXPERIENCE

Graduate Student Instructor (GSI), UC Berkeley Aug. 2013 – May 2015

Physics 111A: Basic Semiconductor Circuits Laboratory
Physics 111B: Experimental Physics
Taught over 200 Undergraduates in the canonical UC Berkeley Physics major lab series courses. Including the basic electronics, LabView programming, use of lab equipment, data analysis, and results presentation.

Berkeley Connect Aug. 2015-May 2016

Designed and taught lessons to introduce first- and second year students to concepts in physics.
Provided one-on-one mentorship for undergrad physics majors.

PROFESSIONAL OUTREACH AND ACADEMIC SERVICE

Society of Women in Physical Sciences 2014-2019
Head Coordinator (2017-2018); Speaker tea coordinator (2014-2017); Webmaster (2014-2016)
Create and direct programming to increase community and mentorship, serving underrepresented groups in the physical sciences. Outreach to admitted women graduate students in Physics.

Science Policy Group at UC Berkeley 2018-2019
Member, Sacramento science advocacy trip participant (2018)

Materials Science Division, Lawrence Berkeley Lab 2018-2020
Diversity and Inclusion Representative for the Orenstein Group

Department of Energy SULI Program Mentor, Lawrence Berkeley National Lab Summer 2016
Designed a project and provided mentorship for an undergraduate to complete the internship program.

Physics 111 Course Restructuring Committee, Physics Department, UC Berkeley 2014-2015
Provided input to the department on the restructuring and improvement of the Physics 111 lab course series.

Cal Day Volunteer 2014 – 2016
Operated fun physics demos for the public at the annual UC Berkeley Open House.

CERN Antiproton decelerator 2012
Official Tour Guide