

Peyton D. Murray, Ph. D.



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Skills	Open-Source Leadership, Scientific Computing, Data Visualization, Full-Stack Development		
Languages	Python, Go, C/C++, Rust, Typescript		
Frameworks & Tools	CI/CD (GitHub Actions), FastAPI, Django, React, PostgreSQL, Pytest, Python scientific ecosystem, Meson		
Experience	Quansight	<i>Senior Software Engineer</i>	May 2021 - Present
	<ul style="list-style-type: none">Backend open-source engineer in Quansight's consulting branch. Contributed open source bug fixes, feature development, and maintenance for large and critical packages in the Python scientific ecosystem, including jupyter, scipy, numpy, conda, and many smaller projects.Reduced ray's CI documentation build time (~1hr) by 50%, and automated the building, linting, publishing, and testing of the tensorflow ecosystem with ~40 CI/CD workflows spread across multiple projects.Built and released Python code in addition to C/C++ and Rust for performance-critical applications.Led design and delivery for open source contracts as tech lead for teams of 5-10 engineers on projects used by millions of developers, including NumPy, SciPy, Jupyter, Ray, TensorFlow. Delivered all contracts on schedule and within budget.Mentored and advocated for a global team of junior engineers; managed multiple open-source contracts simultaneously.		
	Voltaiq	<i>Software Engineer</i>	Oct 2019 - May 2021
	<ul style="list-style-type: none">Developed, deployed, and maintained a SAAS data analytics platform for the world's largest battery manufacturers and consumers.Built REST APIs (Python, Django, PostgreSQL) and React dashboards with Plotly.js for data visualization.		
	Tampere University	<i>Postdoctoral Scholar</i>	Jan 2019 - Aug 2019
	<ul style="list-style-type: none">Developed 3D voronoi tessellation and performance improvements for an open-source magnetics simulation engine using Go and CUDA C.Scaled simulations by automating configuration and parallelizing across a GPU cluster using SLURM.		
	UC Davis Department of Physics	<i>Graduate Student Researcher</i>	Aug 2012 - Dec 2018
	<ul style="list-style-type: none">Developed open source Python tools for analyzing and plotting magnetic measurements and MCMC sample analysis.		
	Lawrence Berkeley National Laboratory	<i>Junior Specialist</i>	May 2011 - May 2012
	<ul style="list-style-type: none">Developed control software (C++ and Qt) for automated circuit testing. Hardware tested with this system was deployed as part of the Insertable B-Layer system at the Large Hadron Collider in 2014, enabling continued studies of the Higgs boson.		
	St. Mary's College of California · Moraga, CA	<i>Research Assistant</i>	Sep 2010 - May 2011
	<ul style="list-style-type: none">Classified astronomical data from the Arecibo Observatory as part of the ALFALFA Collaboration.		
Education	University of California, Davis: M.S. & Ph.D. Physics		2012 - 2018
	St Mary's College of California: B.S. Physics, Minor: Mathematics		2007 - 2011
Teaching	<i>Teaching Assistant, Physics Department, University of California, Davis</i>		2012 - 2016
	<i>Student Tutor and Live-In Mentor, Dept. of Physics, St Mary's College of California</i>		2010 - 2011
Laboratory Skills	<i>Fabrication</i>		
	Sputtering, e-beam evaporation, and e-beam-/photo-lithography and lift-off.		
	<i>Magnetic Characterization</i>		

Vibrating sample magnetometry (VSM), magneto-optic Kerr effect (MOKE), SQUID magnetometry, and magnetoresistance.

Other Techniques

X-ray diffraction (XRD), reciprocal space mapping (RSM), scanning electron microscopy (SEM), polarized neutron reflectometry (PNR), x-ray absorption spectroscopy (XAS) and magnetic circular dichroism (XMCD), and electrical techniques including Hall effect and van der Pauw resistivity methods.

Publications

1. Murray, P. D. et al. [Electrically Enhanced Exchange Bias via Solid-State Magneto-ionics](#). ACS Applied Materials & Interfaces 13 (32), 38916–38922 (2021).
2. Burks, E. C. et al. [3D Nanomagnetism in Low Density Interconnected Nanowire Networks](#). Nano Letters 21, 716–722. issn: 1530-6984 (2021).
3. Gilbert, D. A. et al. [Reconstructing phase-resolved hysteresis loops from first-order reversal curves](#). Scientific Reports 11, 4018. issn: 2045-2322 (2021).
4. Murray, P. D. et al. [Interfacial-Redox-Induced Tuning of Superconductivity in YBa₂ Cu₃ O_{7-δ}](#). ACS Applied Materials & Interfaces, 9b18820. issn: 1944-8244 (2020).
5. Karayev, S. et al. [Interlayer exchange coupling in Pt/Co/Ru and Pt/Co/Ir superlattices](#). Physical Review Materials 3, 041401 (2019).
6. Rippy, G. et al. [X-ray nanodiffraction studies of ionically controlled nanoscale phase separation in cobaltites](#). Physical Review Materials 3, 082001. issn: 2475-9953 (2019).
7. Skaugen, A. et al. [Analytical computation of the demagnetizing energy of thin film domain walls](#). Phys. Rev. B 100, 094440 (2019).
8. Gilbert, D. A. et al. [Ionic tuning of cobaltites at the nanoscale](#). Physical Review Materials 2, 104402 (2018).
9. Quintana, A. et al. [Voltage-Controlled ON–OFF Ferromagnetism at Room Temperature in a Single Metal Oxide Film](#). ACS Nano 12, 10291–10300 (2018).
10. De Toro, J. A. et al. [Remanence plots as a probe of spin disorder in magnetic nanoparticles](#). Chemistry of Materials 29, 8258–8268 (2017).
11. Sun, L. et al. [Magnetization reversal in kagome artificial spin ice studied by first-order reversal curves](#). Physical Review B 96, 144409 (2017).
12. Zhang, Q. et al. [Magnetic fingerprint of interfacial coupling between CoFe and nanoscale ferroelectric domain walls](#). Applied Physics Letters 109, 082906 (2016).
13. The ATLAS IBL Collaboration. [Prototype ATLAS IBL modules using the FE-I4A front-end readout chip](#). Journal of Instrumentation 7, P11010–P11010 (2012).

Selected Conferences

- P. D. Murray. Invited colloquium: Tuning Ionic Distributions for Multifunctional Materials. Tampere University, Tampere, Finland (2019).
- P. D. Murray, D. A. Gilbert, A. J. Grutter, B. J. Kirby, D. Hernandez-Maldonado, M. Varela, Z. E. Brubaker, R. V. Chopdekar, V. Taufour, R. Zieve, J. R. Jeffries, E. Arenholz, Y. Takamura, J. Borchers, and K. Liu. Poster: Interfacial-Redox-Induced Tuning of Superconductivity in YBa₂ Cu₃ O_{7-δ}. International Conference on Magnetism and Magnetic Materials, San Francisco, CA (2018).
- P. D. Murray, Z. Chen, D. A. Gilbert, J. Zang, T. Stücker, K. Lenz, B. B. Maranville, J. Fassbender, H. Yu, J. Borchers, and K. Liu. Poster: Topological Hall Effect in Planar Artificial Skyrmion Lattices. Conference on Magnetism and Magnetic Materials, Pittsburgh, PA (2017).
- P. D. Murray, D. A. Gilbert, A. J. Grutter, A. L. Ionin, R. V. Chopdekar, A. T. N'Diaye, B. J. Kirby, B. Maranville, Y. Takamura, E. Arenholz, K. Liu, and J. Borchers. Talk: Complete Suppression of Magnetism in Gd/(La,Sr)CoO₃ Films via Redox Design of Oxygen

Awards

3rd Place Winner, 2020 John D. Hunter Excellence in Plotting Contest. [Entry \(video\)](#), [Source repository](#)