# Peyton D. Murray, Ph. D.

in  GitHub  home  iD  RG

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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**  *Senior Software Engineer*  May 2021 - Present

- 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.
- 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.

**Voltaiq**  *Software Engineer*  Oct 2019 - May 2021

- 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**  *Postdoctoral Scholar*  Jan 2019 - Aug 2019

- 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**  *Graduate Student Researcher*  Aug 2012 - Dec 2018

- Developed open source Python tools for analyzing and plotting magnetic measurements and MCMC sample analysis.

**Lawrence Berkeley National Laboratory**  *Junior Specialist*  May 2011 - May 2012

- 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  *Research Assistant*  Sep 2010 - May 2011

- Classified astronomical data from the Arecibo Observatory as part of the ALFALFA Collaboration.

**Education**

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| 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**

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| *Teaching Assistant*, **Physics Department, University of California, Davis** | 2012 - 2016 |
| *Student Tutor and Live-In Mentor*, **Dept. of Physics, St Mary's College of California** | 2010 - 2011 |

**Laboratory Skills**

*Fabrication*

  Sputtering, e-beam evaporation, and e-beam-/photo-lithography and lift-off.

*Magnetic Characterization*

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 O7−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 O7−δ . International Conference on Magnetism and Magnetic Materials, San Francisco, CA (2018).
- P. D. Murray, Z. Chen, D. A. Gilbert, J. Zang, T. Stückler, 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. 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](#)