

Carter Turnbaugh

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Education

University of California, Berkeley

B.A. Physics, Applied Mathematics, GPA: 3.90

Berkeley, CA

2017–

The Nueva School

High School Diploma

San Mateo, CA

2013–2017

Research

Laser Phase Plate for Phase Contrast Electron Microscopy

Berkeley, CA

Advisor: Holger Müller

2017–

Worked with team developing high power near-concentric Fabry-Perot cavity to phase shift electrons in a transmission electron microscope using the ponderomotive potential.

Wrote control system enabling automated experiment control, improved experiment logging, and microscope data collection.

Designed and programmed FPGA based feedback controller, allowing cavity locking at high powers.

Publications

Axelrod, Jeremy J., Sara L. Campbell, Osip Schwartz, **Carter Turnbaugh**, Robert M. Glaeser, and Holger Müller. "Observation of the Relativistic Reversal of the Ponderomotive Potential". In: *Phys. Rev. Lett.* 124 (17 May 2020), p. 174801. DOI: 10.1103/PhysRevLett.124.174801. URL: <https://link.aps.org/doi/10.1103/PhysRevLett.124.174801>.

Schwartz, Osip, Jeremy J. Axelrod, Sara L. Campbell, **Carter Turnbaugh**, Robert M. Glaeser, and Holger Müller. "Laser phase plate for transmission electron microscopy". In: *Nature Methods* 16.10 (Oct. 2019), pp. 1016–1020. ISSN: 1548-7105. DOI: 10.1038/s41592-019-0552-2. URL: <https://doi.org/10.1038/s41592-019-0552-2>.

Turnbaugh, Carter, Jeremy J. Axelrod, Sara L. Campbell, Jeske Y. Dioquino, Petar N. Petrov, Jonathan Remis, Osip Schwartz, Zanlin Yu, Yifan Cheng, Robert M. Glaeser, and Holger Mueller. "High-Power Near-Concentric Fabry-Perot Cavity for Phase Contrast Electron Microscopy". In: *arXiv* (2020).

Presentations

Turnbaugh, Carter, Osip Schwartz, Jeremy J. Axelrod, Sara L. Campbell, Robert M. Glaeser, and Holger Müller. "Laser control of transmission electron microscope electron wave function". Poster presented at 50th Annual Meeting of the APS Division of Atomic, Molecular, & Optical Physics. May 2019. URL: <http://meetings.aps.org/Meeting/DAMOP19/Session/E01.77>.

Relevant Coursework

Physics: Classical Mechanics, Quantum Mechanics, Classical Electromagnetism, Solid State, Statistical Mechanics, Quantum Field Theory, Instrumentation

Mathematics: Abstract Algebra, Linear Algebra, Real Analysis, Complex Analysis, Numerical Analysis, Ordinary Differential Equations, Partial Differential Equations

Computer Science: MATLAB, Computer Architectures

Awards

Honors to Date *2018 Spring, 2018 Fall, 2019 Spring, 2019 Fall*

Dean's List *2018 Fall, 2019 Spring, 2019 Fall*

Isidore Pomerantz Endowment *2019–2020*

Employment

Boray Data **Beijing, China (remote)**

Programmer *June–August 2014, 2015, 2016, and 2017*

Developed and maintained automated database regression testing system. Set up testing environment on AWS EC2 platform

Wrote JDBC database command line interface for Windows and Linux/Unix

Developed web-based distributed database management system

Argyle Data **San Mateo, CA**

QA Engineer *June–August 2012 and 2013*

Developed tools for automated database regression and performance testing

Activities

Berkeley Society of Physics Students

Head of Web Development *Fall 2020–Spring 2021*

Led and taught students to develop and maintain Berkeley SPS website.

Additional Skills

Software: C, C++, CUDA, Python, Java, MATLAB, JavaScript, Bash, SQL, Linux

Hardware: Verilog, Serial, CAN, SPI, Arduino, ARM Cortex-M

Fabrication: Soldering, Solidworks, Milling, (Metal) Turning

Other: FEI Titan TEM