

## LEIGH S. MARTIN

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### Education

University of California at Berkeley  
Enrolled in the Physics PhD program  
University of Colorado at Boulder, B.A., Physics.  
Graduated May 2012, Summa Cum Laude with Distinction.  
Science and Mathematics GPA: 4.0; Cumulative GPA: 3.99

### Honors and Awards

National Science Foundation Graduate Fellowship (2013, three years over five year period)  
Berkeley Fellowship for Graduate Study (2013, two years)  
National Defense Science and Engineering Fellowship (declined for NSF fellowship)  
Physics Outstanding Graduate (spring 2012, University of Colorado at Boulder)  
Jacob Van Ek award (spring 2011, University of Colorado at Boulder)  
Dean's Scholar Award (2009, 2010, 2011, University of Colorado at Boulder)  
Dean's List Honoree (2008 – 2012, University of Colorado at Boulder)  
High School Valedictorian and Mathematics Award (2008)

### Publications

1. S. Hacothen-Gourgy, **L. Martin** (*co-first author*), E. Flurin, V. V. Ramasesh, K. B. Whaley, I. Siddiqi, "Dynamics of Simultaneously Measured Non-Commuting Observables," in press at *Nature*.
2. **L. Martin**, R. Y. Bello, C. W. Hogle, A. Palacios, X. M. Tong, J. L. Sanz-Vicario, T. Jahnke, M. Schöffler, R. Dörner, Th. Weber, F. Martín, H. C. Kapteyn, M. M. Murnane, and P. Ranitovic, "Revealing the Role of Electron-Electron Correlations by Mapping Dissociation of Highly Excited  $D_2^+$  using Ultrashort XUV Pulses," *under review*.
3. E. Flurin, V. V. Ramasesh, S. Hacothen-Gourgy, **L. Martin**, N. Y. Yao, I. Siddiqi, "Observing Topological Invariants Using Quantum Walks in Superconducting Circuits," *under review*.
4. M. Kimchi-Schwartz, **L. Martin**, E. Flurin, C. Aron, M. Kulkarni, H. Tureci, I. Siddiqi, "Stabilizing Entanglement via Symmetry-Selective Bath Engineering in Superconducting Qubits," *Phys. Rev. Lett.* **116**, 240503 (2016).
5. **L. Martin**, F. Motzoi, H. Li, M. Sarovar, B. Whaley, "Deterministic Generation of Remote Entanglement with Active Quantum Feedback," *Phys. Rev. A* **92**, 062321 (2015).
6. C. Hogle, X. Tong, **L. Martin**, M. Murnane, H. Kapteyn, P. Ranitovic, "Attosecond Coherent Control of Single and Double Photoionization in Argon," *Phys. Rev. Lett.* **115**, 173004 (2015).
7. P. Ranitovic, C. Hogle, P. Riviere, A. Palacio, X. Tong, N. Tushima, A. Gonzalez-Castrillo, **L. Martin**, F. Martín, M. Murnane, H. Kapteyn, "Attosecond VUV Coherent Control of Molecular Dynamics," *PNAS* vol. 111 no. 3 912-17 (2014).
8. **L. Martin**, C. Chen, J. Miao, "Multi-Shell Ankylography," arXiv: 1311.4517 (2013). - <http://arxiv.org/abs/1311.4517>
9. D. Adams, **L. Martin** (*co-first author*), M. Seaberg, D. Gardner, H. Kapteyn, M. Murnane, "A Generalization for Optimized Phase Retrieval Algorithms," *Optics Express* **20**, 24778-90 (2012).
10. D. Gardner, B. Zhang, M. Seaberg, **L. Martin**, D. Adams, F. Salmassi, E. Gullikson, H. Kapteyn, M. Murnane, "High Numerical Aperture Reflection Mode Tabletop Optical Diffraction Microscopy Using Off-Axis Apertured Illumination," *Optics Express* **20** 19050-9 (2012).
11. J. Miao, C. Chen, Y. Mao, **L. Martin**, H. Kapteyn, "Potential and Challenge of Ankylography," <http://arxiv.org/abs/1112.4459> (2011).

### ***Presentations***

1. **Invited Talk: L. Martin**, I. Siddiqi, K. B. Whaley, “Quantum Control in Superconducting Circuits,” IMA Conference on Nano and Quantum Control, April 2016.
2. **L. Martin**, S. Hacohen-Gourgy, E. Flurin, V. Ramasesh, “Simultaneous Measurement of Non-Commuting Observables: Part I,” APS March Meeting, 2016.
3. **L. Martin**, F. Motzoi, H. Li, M. Sarovar, B. Whaley, “Optimal Feedback for Remote Entanglement,” APS March Meeting, 2015.
4. **L. Martin**, C. Hogle, P. Ranitovic, M. Murnane, H. Kapteyn, “Applications of High Harmonic Generation,” Stanford Linear Accelerator Photon Science Seminar, September 2012.
5. C. Hogle, P. Ranitovic, **L. Martin**, M. Murnane, H. Kapteyn, W. Peters, A. P. Spencer, D. Jonas, X. Tong, N. Toshima, “Ultrafast Dynamics of Ozone Exposed to Ionizing Radiation,” DAMOP, June 2012.
6. P. Ranitovic, C. Hogle, **L. Martin**, W. Peters, A. Spencer, D. Jones, X. Tong, M. Murnane, H. Kapteyn, “Ultrafast Dynamics of Ozone Exposed to Ionizing Radiation,” CLEO, May 2012.
7. **L. Martin**, C. Chen, M. Seaberg, D. Adams, J. Miao, “Multiple Shell Ankylography,” CLEO, May 2012.
8. B. Zhang, D. Gardner, **L. Martin**, M. Seaberg, D. Adams, M. Murnane, H. Kapteyn, “Coherent Diffraction Imaging with an Apertured Illumination Support,” CLEO, May 2012.
9. C. Hogle, P. Ranitovic, X. Tong, **L. Martin**, M. Murnane, H. Kapteyn, “Visualization of D2 Nuclear Wave Packets with High Harmonic Radiation,” Gordon Research Conference, February 2012.
10. **L. Martin**, C. Chen, M. Seaberg, D. Adams, J. Miao, “Multiple Shell Ankylography,” CUR, October 2011.

### ***Research Experience***

*Siddiqi and Whaley groups, UC Berkeley:*

*February 2013 – present*

Design and implementation of experiments in superconducting circuits  
Theoretical development of continuous measurement and quantum feedback

*Quantum Optics Group of Tilman Esslinger - ETH Zurich:*

*October 2012 – July 2013*

High power supply for magneto-optical trapping  
Construction of a cavity QED/BEC experiment

*Kapteyn-Murnane Research Group - JILA, University of Colorado at Boulder:*

*January 2010 - September 2012*

Ultrafast three-dimensional ion momentum spectroscopy (COLTRIMS), data acquisition and analysis  
Coherent diffraction imaging  
Computational and mathematical development of new phase retrieval algorithm  
High-speed electronic FPGA and computer-based laser stabilization  
Numerous analog and digital electronics projects  
Spectral broadening of ultrafast pulses via self-phase modulation

*Miao Group - Department of Physics and Astronomy, University of California, Los Angeles*

*June - August 2012*

Development of mathematical description of the capabilities of three-dimensional diffraction imaging (ankylography)  
Experimental implementation of ankylography  
Simulation and theoretical study of ankylography

### ***Skills***

One semester of assistant teaching (3<sup>rd</sup> year electricity and magnetism) - Learning Assistant Program at the University of Colorado at Boulder  
Ultrafast and nonlinear optics  
Ultrahigh Vacuum Equipment  
Analog, digital and high power electronics  
Metal machining and CAD design  
Atom trapping and cooling

Programming languages: Python , MATLAB, LabVIEW, C++, Verilog Hardware Description Language (low level, FPGA), Mathematica, OpenGL, PIC (programmable integrated circuit) Basic, Latex  
Conversant in Spanish  
Beginner in German, French and Mandarin Chinese

***Volunteer Activities***

Exploratorium volunteer – (Spring 2015-present)  
UC Berkeley Compass Project – Undergraduate Research Project Supervisor (Fall 2013), public science demonstrations  
Science Discovery Workshop (summer 2010, summer 2011)  
JILA Wizard's Show (Spring 2010)  
Weekly math and science tutoring at Boulder High (2008 - 2010)  
Traveled to Mexico, Costa Rica, Nicaragua and Guatemala for various service projects (2007 - 2010)  
Mentoring and tutoring at Johnson elementary, Denver CO (2008 - 2009)