

# Matthew Robert Buckley

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**Citizenship** United States of America

## Education

- **2003-2008** University of California, Berkeley  
Ph.D. Theoretical Particle Physics (received May 2008)  
Advisor: Professor Hitoshi Murayama  
M.A. Physics (received May 2005)
- **1999-2003** Kenyon College  
B.A. *summa cum laude* Mathematics and Physics (received May 2003)

## Work Experience

- **September 2013-Present** Assistant Research Professor, Rutgers, The State University of New Jersey
- **August 2010-August 2013** David N. Schramm Fellow, Fermi National Accelerator Laboratory
- **September 2008-August 2010** Du Bridge Postdoctoral Scholar, Prize Fellow, California Institute of Technology
- **January-May 2008** Foreign Researcher, Institute of Physics and Mathematics of the Universe, Tokyo University
- **2006-2008** Graduate Student Researcher with Hitoshi Murayama, University of California, Berkeley
- **2003-2006** Graduate Student Instructor, University of California, Berkeley

## Fellowships and Awards

- **2010** David N. Schramm Fellow, Fermi National Accelerator Laboratory
- **2008** Prize Fellowship, California Institute of Technology
- **2004** Outstanding Graduate Student Instructor Award, University of California, Berkeley
- **2002** Phi Beta Kappa, Kenyon College
- **2002** Franklin Miller Award for Undergraduate Research, Kenyon College
- **2001** Goldwater Scholar in Mathematics, Science and Engineering (Barry M. Goldwater Scholarship and Excellence in Education Foundation)

## Conferences, Summer Schools and Invited Talks

- **September 2014** Perimeter Institute
- **September 2014** *Workshop on Searches for New Phenomena at the Upgraded LHC*, TRIUMF
- **June 2014** Conference on Interconnections between Particle Physics and Cosmology, Guanajuato, Mexico
- **May 2014** University of California, Irvine
- **May 2014** California Institute of Technology
- **May 2014** *Phenomenology Symposium*, Pittsburgh
- **April 2014** *Center for Future High Energy Physics*, Beijing
- **February 2014** University of Massachusetts, Amherst
- **January 2014** *Frontiers in Particle Physics: From Dark Matter to the LHC and Beyond*, Aspen Winter Conference
- **November 2013** Physics Colloquium, University of New Mexico
- **October 2013** *The Dark Matter Paradigm: Current Status and Challenges*, Princeton University
- **October 2013** *Kinematic Variables for New Physics at the LHC*, California Institute of Technology
- **September 2013** *Dark Matter at the LHC*, KICP, University of Chicago

- **August-September 2013** *Dark Matter in Galaxies, the LHC and Direct and Indirect Searches: Are We Near the End of the Road?*, Aspen Summer Conference
- **August 2013** *Self-Interacting Dark Matter Workshop*, Harvard University
- **July 2013** *LHC - The First Part of the Journey*, KITP, University of California, Santa Barbara
- **April-May 2013** *Identifying and Characterizing Dark Matter via Multiple Probes*, KITP, University of California, Santa Barbara
- **March 2013** *The First Three Years of the LHC*, Mainz, Germany
- **March 2013** *Higgs Quo Vadis*, Aspen Winter Conference
- **January 2013** University of California, Riverside
- **January 2013** *Physics of the Universe Summit*, California Institute of Technology/SpaceX
- **July 2012** *Identification of Dark Matter*, Chicago (Local Organizer)
- **June 2012** *International Conference on New Frontiers in Physics*, Koylmbari, Greece
- **May 2012** *Dark Matter Signatures in the Gamma-ray Sky*, University of Texas, Austin
- **May 2012** *Workshop on LHC Physics*, University of Chicago
- **April 2012** *LHC Workshop*, Princeton University
- **April 2012** University of Illinois, Chicago
- **April 2012** Texas A&M, College Station, Texas
- **January 2012** California Institute of Technology, Pasadena, California
- **January 2012** Rutgers University, New Brunswick, New Jersey
- **January 2012** *The Hunt for New Physics, from the Alps to the Plains to the Rockies*, Aspen Winter Conference
- **January 2012** University of Wisconsin, Madison, Wisconsin
- **December 2011** The Ohio State University, Columbus, Ohio
- **December 2011** *Intensity Frontier Workshop*, Department of Energy, Rockville, Maryland
- **October 2011** Kenyon College, Gambier, Ohio
- **October 2011** KICP, University of Chicago

- **October 2011** University of Washington, Seattle
- **September 2011** *2011 Workshop on Baryon and Lepton Number Violation*, Gatlinburg, Tennessee
- **September 2011** *Supersymmetry 2011*, Fermilab
- **August 2011** *A Theoretical & Experimental Vision for Direct & Indirect Dark Matter Detection*, Aspen Summer Conference
- **August 2011** *TevPA 2011*, Stockholm, Sweden
- **June 2011** *Shanghai Particle Physics Symposium*, Shanghai Jiao Tong University, Shanghai, China
- **April 2011** *Implications of Electroweak Symmetry Breaking*, University of Wisconsin, Madison
- **March 2011** Theoretical Physics Group, University of California, Berkeley
- **February 2011** *New Data from the Energy Frontier*, Aspen Winter Conference
- **February 2011** *Indirect and Direct Detection of Dark Matter*, Aspen Winter Conference (Organizer)
- **January 2011** *Physics of the Universe Summit*, California Institute of Technology/SpaceX
- **January 2011** Theoretical Physics Group, University of California, Davis
- **December 2010** *Dark Matter All Around*, Institut d'Astrophysique de Paris
- **December 2010** Institute for Theoretical Physics, University of Heidelberg
- **October 2010** University of Pittsburgh/Carnegie Mellon University
- **October 2010** T2 Division, LANL
- **October 2010** Vanderbilt University
- **September 2010** *Topologies for Early LHC Searches 2010 Workshop*, SLAC
- **September 2010** Theoretical Physics Group, Fermilab
- **June-July 2010** *From Colliders to the Dark Sector: Understanding Dark Matter at Particle Colliders and Beyond*, Aspen Summer Conference
- **March 2010** University of California, Davis
- **February 2010** *Dark Matter 2010*, University of California, Los Angeles
- **January 2010** *Direct and Indirect Detection of Dark Matter*, MCTP, University of Michigan

- **January 2010** MCTP, University of Michigan
- **January 2010** *The Revolution in Particle Physics is Here*, Aspen Winter Conference
- **January 2010** *Physics of the Universe Summit*, California Institute of Technology/SpaceX
- **December 2010** Theoretical Astrophysics Group, Fermilab
- **October 2009** *Searching for New Physics at the LHC*, Galileo Galilei Institute, Florence, Italy
- **September 2009** Boston University
- **September 2009** *Searches for New Forces at the GeV-scale*, SLAC
- **September 2009** *Dark Matter Annihilation In the Interstellar Medium*, Fermilab
- **July 2009** *Beyond the Standard Model Physics at the Threshold*, Aspen Summer Conference
- **April 2009** *Physics Opportunities with First LHC Data*, University of California, Berkeley
- **March 2009** SLAC
- **February 2009** *Physics at the LHC Era*, Aspen Winter Conference
- **January 2009** *Dark 2009*, University of Canterbury, Christchurch, New Zealand
- **November 2008** *LCWS 2008*, University of Illinois, Chicago
- **November 2008** University of California, Irvine
- **October 2008** California Institute of Technology
- **September 2008** Kenyon College, Gambier, Ohio
- **September 2008** *From the Tevatron to the LHC*, Fermilab
- **June 2008** *TASI 2008: The Dawn of the LHC Era*, University of Colorado, Boulder
- **May 2008** *Dark Side II*, University of Michigan, Ann Arbor
- **May 2008** LBNL, University of California, Berkeley
- **April 2008** *Pheno 2008*, University of Wisconsin, Madison
- **March 2008** Theoretical Physics Group, KEK, Japan
- **March 2008** *TILC08*, Tohoku University, Japan

- **January 2008** Institute for the Physics and Mathematics of the Universe, Tokyo University
- **December 2007** Argonne National Laboratory
- **November 2007** LEPP, Cornell University
- **November 2007** LANL
- **October 2007** SCIPP, University of California, Santa Cruz
- **October, 2007** Institute for High Energy Physics, University of California, Davis
- **October 2007** SLAC
- **July 2007** *PITP 2007: The Standard Model and Beyond*, Institute for Advanced Study
- **July 2007** *Implications of Neutrino Flavor Oscillations*, Sante Fe Summer Workshop, LANL
- **April 2007** LBNL, University of California, Berkeley
- **March 2006** LBNL, University of California, Berkeley

## Publications

Total citations of published papers: 1,447 (for 38 papers, as of September 14<sup>th</sup>, 2014)  
*H*-index: 21

**Don't Miss the Displaced Higgs at the LHC Again** MRB, Valerie Halyo, and Paul Lujan. arXiv: 1405.2082.

**Scattering, Damping, and Acoustic Oscillations: Simulating the Structure of Dark Matter Halos with Relativistic Force Carriers** MRB, Jesús Zavala, Francis-Yan Cyr-Racine, Kris Sigurdson, and Mark Vogelsberger. Phys. Rev. D **90** (2014) 043524. arXiv:1405.2075.

**Stop on Top** MRB, Tilman Plehn, and Michael J. Ramsey-Musolf. Phys. Rev. D **90** (2014) 014046. arXiv:1403.2726.

**Buckets of Higgs and Tops** MRB, Tilman Plehn, Torben Schell, and Michihisa Takeuchi. JHEP **1402** (2014) 130. arXiv:1310.6034.

**Super-Razor and Searches for Stopped and Charginos at the LHC** MRB, Joseph D. Lykken, Christopher Rogan, and Maria Spiropulu. Phys. Rev. D **89** (2014) 055020. arXiv:1310.4827.

**Using Effective Operators to Understand CoGeNT and CDMS-Silicon** MRB. Phys. Rev. D **88** (2013) 5, 055028. arXiv:1308.4146.

**Phenomenology of Dirac Neutralino Dark Matter** MRB, Dan Hooper, and Jason Kumar. Phys. Rev. D **88** (2013) 5, 055028. arXiv:1307.3561.

**A Spin-Dependent Interpretation for Possible Signals of Light Dark Matter** MRB and W. Hugh Lippincott. Phys. Rev. D **88**, (2013) 056003. arXiv:1306.2349.

**Buckets of Tops** MRB, Tilman Plehn, and Michihisa Takeuchi. JHEP **1308** (2013) 086. arXiv:1302.6238.

**Thermal Dark Matter from a Confining Sector** MRB and Ethan T. Neil. Phys. Rev. D **87** (2013) 043510. arXiv:1209.6054.

**Are There Hints of Light Stops in Recent Higgs Search Results?** MRB and Dan Hooper. Phys. Rev. D **86** (2012) 075008. arXiv:1207.1445

**Implications of a 130 GeV Gamma-Ray Line for Dark Matter** MRB and Dan Hooper. Phys. Rev. D **86** (2012) 043524. arXiv:1205.6811

**Stops and MET: The Shape of Things to Come** Daniele S.M. Alves, MRB, Patrick J. Fox, Joseph D. Lykken, and Chiu-Tien Yu. Phys. Rev. D **87** (2013) 3, 035016. arXiv:1205.5805

- Precision Probes of a Leptophobic  $Z'$  Boson** MRB and Michael J. Ramsey-Musolf.  
Phys. Lett. B **712** (2012) 261-265. arXiv:1203.1102
- Searching For Dark Matter Subhalos in the Fermi-LAT Second Source Catalog**  
Alexander V. Belikov, Dan Hooper, and MRB. Phys. Rev. D **86** (2012) 043504.  
arXiv:1111.2613
- Toward A Consistent Picture For CRESST, CoGeNT and DAMA** Chris Kelso,  
Dan Hooper, and MRB. Phys. Rev. D **85** (2012) 043515. arXiv:1110.5338
- Regenerating a Symmetry in Asymmetric Dark Matter** MRB and  
Stefano Profumo. Phys. Rev. Lett. **108** (2012) 011301. arXiv:1109.2164
- What the Tevatron Found?** MRB, Dan Hooper, Joachim Kopp, Adam Martin,  
and Ethan T. Neil. JHEP **1110** (2011) 063. arXiv:1107.5799
- A Leptophobic  $Z'$  And Dark Matter From Grand Unification** MRB, Dan Hooper,  
and Jonathan L. Rosner. Phys. Lett. B **703** (2011) 343-347. arXiv:1106.3583
- Dark Forces at the Tevatron** MRB, Dan Hooper, Pavel Fileviez Perez, and  
Ethan T. Neil. Phys. Lett. B **702** (2011) 256-259. arXiv:1104.3145
- Asymmetric Dark Matter and Effective Operators** MRB.  
Phys. Rev. D **84**, 043510 (2011) arXiv:1104.1429
- Light  $Z'$  Bosons at the Tevatron** MRB, Dan Hooper, Joachim Kopp, and  
Ethan T. Neil. Phys. Rev. D **83** (2011) 115013. arXiv:1103.6035
- Particle Physics Implications for CoGeNT, DAMA, and Fermi** MRB, Dan Hooper,  
and Tim M.P. Tait. Phys. Lett. B **702** (2011) 216-219. arXiv:1011.1499
- Xogenesis** MRB and Lisa Randall. JHEP **1109** (2011) 009. arXiv:1009.0270
- Diagnosing Spin at the LHC via Vector Boson Fusion** MRB and  
Michael J. Ramsey-Musolf. JHEP **1109** (2011) 094. arXiv:1008.5151
- Stable Colored Particles R-SUSY Relics or Not?** MRB, Bertrand Echenard,  
Dilani Kahawala, and Lisa Randall, JHEP **1101** (2011) 013. arXiv:1008.2756
- Dark Matter Subhalos In the Fermi First Source Catalog** MRB and Dan Hooper.  
Phys. Rev. D **82**, 063501 (2010). arXiv:1004.1644
- The Sensitivity of the IceCube Neutrino Detector to Dark Matter Annihilating  
in Dwarf Galaxies** Pearl Sandick, Douglas Spolyar, MRB, Katherine Freese, and  
Dan Hooper. Phys. Rev. D **81**, 083506 (2010). arXiv:0912.0513
- Cascade Events at IceCube+DeepCore as a Definitive Constraint on the Dark  
Matter Interpretation of the PAMELA and Fermi Anomalies** Sourav

- K. Mandal, MRB, Katherine Freese, Douglas Spolyar, and Hitoshi Murayama. Phys. Rev. D **81**, 043508 (2010). arXiv:0911.5188
- Dark Matter Self Interactions and the Sommerfeld Effect** MRB and Patrick J. Fox. Phys. Rev. D **81**, 083522 (2010). arXiv:0911.3898
- LHC Searches for Non-Chiral Weakly Charged Multiplets** MRB, Lisa Randall, and Brian Shuve. JHEP **1105** (2011) 097. arXiv:0909.4549
- High-Energy Neutrino Signatures of Dark Matter Decaying into Leptons** MRB, Katherine Freese, Dan Hooper, Douglas Spolyar, and Hitoshi Murayama. Phys. Rev. D **81** (2010) 016006. arXiv:0907.2385
- High Energy Neutrinos As A Test of Leptophilic Dark Matter** Douglas Spolyar, MRB, Katherine Freese, Dan Hooper, and Hitoshi Murayama. arXiv:0905.4764
- Determining Spin through Quantum Azimuthal-Angle Correlations.** MRB, Seong Youl Choi, Kentarou Mawatari, and Hitoshi Murayama. Phys. Lett. B **672**, 275-279 (2009). arXiv:0811.3030
- Dark Matter and Dark Radiation.** Lotty Ackerman, MRB, Sean M. Carroll, and Marc Kamionkowski. Phys. Rev. D **79**, 023519 (2009). arXiv:0810.5126
- Quantum Interference Effects Among Helicities at LEP-II and Tevatron.** MRB, Beate Heinemann, William Klemm, and Hitoshi Murayama. Phys. Rev. D **77**, 113017 (2008). arXiv:0804.0476
- Discriminating spin through quantum interference.** MRB, Hitoshi Murayama, William Klemm, and Vikram Raval. Phys. Rev. D **78**, 014028 (2008). arXiv:0711.0364
- Quark mass uncertainties revive KSVZ axion dark matter.** MRB and Hitoshi Murayama. JCAP 0707:012 (2007). arXiv:0705.0542
- How can we test seesaw experimentally?** MRB and Hitoshi Murayama. Phys. Rev. Lett. **97**, 231801 (2006). arXiv:hep-ph/0606088

## References

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