BRIAN C. ODOM

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PROFESSIONAL PREPARATION

University of Chicago	Physics	Kavli Institute Postdoctoral Fellow, 2004-8
Harvard University	Physics	Ph.D., 2005
Stanford University	Physics	B.S. with Honors, 1995

APPOINTMENTS

2008 - Assistant Professor, Department of Physics and Astronomy, Northwestern University

AWARDS AND HONORS

2014 Finalist, NIST Precision Measurement Grant (awardees to be announced Fall 2014)
2010 Sloan Research Fellow, Alfred P. Sloan Foundation
2009 Young Investigator award (YIP), Air Force Office of Scientific Research
2009 Searle Fellow, Northwestern University
2009 Packard Fellow, David and Lucile Packard Foundation
2009 CAREER Award, National Science Foundation
2008 Kavli Fellow, National Academy of Sciences
2006 Arthur H. Compton Lecturer, Enrico Fermi Institute, University of Chicago
2006 Thesis Award, Division of Atomic, Molecular Optical Physics (DAMOP), APS
2004 Kavli Institute Fellowship, University of Chicago

INVITED PRESENTATIONS

2014 Center for Ultracold Atoms at MIT/Harvard, Seminar, Cambridge, MA
2014 DAMOP conference, Madison, WI
2014 UC Berkeley, AMO Seminar, Berkeley, CA
2014 Indiana University, Colloquium, Bloomington, IN
2014 Argonne National Laboratory, AMO Seminar, Argonne, IL
2013 Midwest Cold Atoms Workshop, Purdue, IN
2013 ITAMP Ion Trapping Workshop, Cambridge, MA
2013 IOTA Molecular Ions Workshop, Arosa, Switzerland
2013 Stanford University, Applied Physics Seminar, Stanford, CA
2013 Georgia Tech, AMO Seminar, Atlanta, GA
2013 Rice University, AMO Seminar, Houston, TX
2013 Duke University, EECS Seminar, Durham, NC
2013 University of Michigan, AMO Seminar, Ann Arbor, MI
2012 University of Wisconsin, AMO Seminar, Madison, WI
2012 European Conference on Trapped Ions (ECTI), Obergurgl, Austria
2012 Georgia Tech, Molecular Ion Workshop, Atlanta, GA
2012 Les Houches School, "Physics with Trapped Charged Particles," Les Houches, France

2012 AFOSR Program Review, Washington, D.C.
2011 Fermilab, Center for Particle Astrophysics Seminar. Batavia, IL
2011 University of Colorado Boulder, Special AMO Seminar. Boulder, CO
2011 Northwestern University, Special AMO Seminar. Evanston, IL
2011 Fermilab, Laboratory Tests of Dark Energy Workshop. Batavia, IL
2011 Midwest Cold Atoms Conference. Evanston, IL
2011 Northwestern University, Heilborn Lecture. Evanston, IL
2011 Argonne National Laboratory, High Energy Seminar. Argonne, IL
2010 NICT, AMO Seminar. Tokyo, Japan
2010 University of Illinois at Urbana-Champaign, AMO Seminar. Urbana, IL
2010 Midwest Cold Atoms Workshop. Ann Arbor, MI
2010 University of Washington, Colloquium. Seattle, WA
2010 Argonne National Laboratory, Heavy Ion Seminar. Argonne, IL
2010 Future Frontiers in Fundamental Physics Conference. Abu Dhabi
2009 Midwest Cold Atoms Conference. Chicago, IL
2008 National Academy of Sciences, Japanese-American Frontiers of Science Symposium. Irvine, CA
2008 Ulm University, AMO Seminar. Ulm, Germany
2008 University of Provence, AMO Seminar. Marseille, France
2008 University of California, Santa Barbara, HEP Seminar. Santa Barbara, CA
2008 University of California, Berkeley, AMO Seminar. Berkeley, CA
2008 Massachusetts Institute of Technology, Nuclear and Particle Colloquium. Boston, MA
2008 University of Michigan, CM/AMO Seminar. Ann Arbor, MI
2008 New York University, Physics Colloquium. New York, NY
2008 New York University, CCPP Seminar. New York, NY
2008 University of Chicago, James Franck Institute Seminar. Chicago, IL
2007 Stanford Linear Accelerator Center, Experimental Seminar. Menlo Park, CA
2006 Argonne National Laboratory, Medium Energy Physics Seminar. Argonne, IL
2006 Yale University, Weak Interactions Seminar. New Haven, CT
2006 University of Maryland, Combined Nuclear/HEP Seminar. College Park, MD
2006 Northwestern University, Physics Colloquium. Evanston, IL
2006 Division of Nuclear Physics, Dark Matter Mini-Symposium. Nashville, TN
2006 Arthur H. Compton Lecturer, Enrico Fermi Institute. University of Chicago, IL http://kicp.uchicago.edu/~odom/compton
2006 6th International Workshop on The Identification of Dark Matter. Rhodes, Greece
2006 APS Division of Atomic Molecular Physics, Thesis Prize presentation. Knoxville, TN
2005 SNOLAB 2005 Workshop. Lively, Canada
2005 Northwestern University, HEP seminar. Evanston, IL
2004 University of Chicago, Kavli Institute seminar. Chicago, IL
2004 Argonne National Laboratory, AMO seminar. Argonne, IL
2004 Third Meeting on CPT and Lorentz Symmetry. Bloomington, IN
2003 University of Chicago, HEP seminar. Chicago, IL

2002 Fermilab, Special seminar. Batavia, IL

1999 Smithsonian Institute for Astrophysics, AMO seminar. Cambridge, MA

PUBLICATIONS FROM NORTHWESTERN UNIVERSITY

1. "Pulsed High Density Molecular Beam for Cold Ion Chemistry" M. Kokish, V. Rajagopal, J.P. Marler, and B.C. Odom, *manuscript in preparation*
2. "Trapped Ion-Chain Thermometry and Composition Analysis by Imaging" V. Rajagopal, J.P. Marler, M. Kokish, and B.C. Odom, *manuscript in preparation*
3. "Single-Ion Doppler Amplification in Three-Level Systems" X. Chen, Y.-W. Lin, and B.C. Odom, *manuscript in preparation*
4. "Broadband optical cooling of molecular rotors from room temperature to the ground state," C.-Y. Lien, C.R. Seck, J.H.V. Nguyen, D. Tabor, B.C. Odom, *arXiv:1402.3918 [physics.atom-ph]* (2014), in peer review stage at *Nature Communications*
5. "Rotational State Analysis of AlH+ by Two-Photon Dissociation," C.M. Seck, E.G. Hohenstein, C.-Y. Lien, P.R. Stollenwerk, B.C. Odom, *J. Mol. Spectrosc.* 300, 108 (2014)
6. "Resonant Few-Photon Excitation of a Single-Ion Oscillator," Y.-W. Lin, S. Williams, and B.C. Odom. *Phys. Rev. A* 87, 011402(R) (2013)
7. "Suitability of linear quadrupole ion traps for large Coulomb crystals," D. Tabor, V. Rajagopal, Y.-W. Lin, and B.C. Odom. *Appl. Phys. B.* 107, 1097 (2012)
8. "Optical pulse-shaping for internal cooling of molecules," C.-Y. Lien, S. Williams, and B.C. Odom. *Phys. Chem. Chem. Phys.*, 13, 18825 (2011)
9. "Challenges of laser-cooling molecular ions," J.H.V. Nguyen, C.R. Viteri, E.G. Hohenstein, C.D. Sherrill, K.R. Brown, and B.C. Odom. *New J. Phys.* 13, 063023 (2011)
10. "Prospects for Doppler cooling of three-electronic-level molecules," J.H.V. Nguyen, and B.C. Odom. *Phys. Rev. A* 83, 053404 (2011)

PUBLICATIONS FROM POSTDOCTORAL, GRADUATE, AND UNDERGRADUATE WORK

1. "Improved Spin-Dependent WIMP Limits from a Bubble Chamber," E. Behnke, J.I. Collar, P.S. Cooper, K. Crum, M. Crisler, M. Hu, I. Levine, D. Nakazawa, H. Nguyen, B.C. Odom, E. Ramberg, J. Rasmussen, N. Riley, A. Sonnenschein, M. Szydagis, and R. Tschirhart. *Science* 319, 933 (2008)
2. "WIMP identification through a combined measurement of axial and scalar couplings," G. Bertone, D.G. Cerdeno, J.I. Collar, and B.C. Odom. *Phys. Rev. Lett.* 99, 151301 (2007)
3. "Development of Bubble Chambers With Enhanced Stability and Sensitivity to Low-Energy Nuclear Recoils," W.J. Bolte, J.I. Collar, M. Crisler, J. Hall, D. Holmgren, D. Nakazawa, B.C. Odom, K. O'Sullivan, R. Plunkett, E. Ramberg, A. Raskin, A. Sonnenschein, and J.D. Vieira. *Nucl. Instrum. Meth. A* 577, 569 (2007)
4. "New Measurement of the Electron Magnetic Moment Using a One-Electron Quantum Cyclotron," B.C. Odom, D. Hanneke, B. D'Urso, and G. Gabrielse. *Phys. Rev. Lett.* 97, 030801 (2006)
5. "New Determination of the Fine Structure Constant from the Electron g Value and QED," G. Gabrielse, D. Hanneke, T. Kinoshita, M. Nio, and B.C. Odom. *Phys. Rev. Lett.* 97 030802 (2006)
6. "A Bubble Chamber for Dark Matter Detection (the COUPP Project Status)," W.J. Bolte, J.I. Collar, M. Crisler, J. Hall, J. Krider, K. Crum, D. Holmgren, C.M. Lei, D. Nakazawa, H. Nguyen,

B.C. Odom, K. O'Sullivan, R. Plunkett, E. Ramberg, A. Raskin, J. Rasmussen, R. Schmit, A. Sonnenschein, M. Szydagis, and J.D. Vieira. *Journal of Physics: Conference Series* 39 126 (2006)

7. "Single-Particle Self-excited Oscillator," B. D'Urso, R. Van Handel, B.C. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 94, 113002 (2005)
8. "Fully Quantum Measurement of the Electron Magnetic Moment," B.C. Odom. Thesis supervised by Gerald Gabrielse, Harvard University (2004).
9. "COUPP: A Heavy-Liquid Bubble Chamber for WIMP Detection," J. Bolte, J.I. Collar, M. Crisler, D. Holmgren, D. Nakazawa, B.C. Odom, K. O'Sullivan, R. Plunkett, E. Ramberg, A. Raskin, A. Sonnenschein, J.D. Vieira. *Proceedings from IDM2004,* Edinburgh, Scotland (2004)
10. "Feedback Cooling of a One-Electron Oscillator," B. D'Urso, B.C. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 90, 043001 (2003)
11. "One-Electron Cyclotron (and Implications for Cold Antihydrogen)," G. Gabrielse, S. Peil, B.C. Odom, and B. D'Urso. In *Atomic Physics 17*, Vol. 551, edited by E. Arimondo, P. DeNatale, and M. Inguscio. American Institute of Physics, Melville, New York, pp. 108-120 (2001)
12. "QND Observation of Quantum Jumps between Fock States: a One-Electron Cyclotron Oscillator at 70 mK to 4.2 K," G. Gabrielse, S. Peil, B.C. Odom, and B. D'Urso. *Proceedings from Quantum Electronics and Laser Science Conference*, Baltimore, MD, USA (1999)
13. "Spectroscopy of Buffer-Gas Cooled Vanadium Monoxide in a Magnetic Trapping Field," J.D. Weinstein, R. deCarvalho, K. Amar, A. Boca, B.C. Odom, B. Friedrich, J.M. Doyle. *J. Chem. Phys.* 109, 2656 (1998)
14. "Quantum Interference in Electron Collision," R. Liu, B.C. Odom, Y. Yamamoto, and S. Tarucha. *Nature* 391, 6664 (1998)

GRANTS FUNDED

2014-19	Army Office of Sponsored Research, $977K (Co-I portion) *"MURI: Precision Chemical Dynamics and Quantum Control of Ultracold Molecular Ion Reactions"*
2014-17	National Science Foundation, $200K (Co-I portion) *"CEMRI: Multifunctional Nanoscale Material Structures"*
2013-15	Air Force Office of Scientific Research, $748K *"Logic-Enabled Spectroscopy of Single Trapped Molecular Ions"*
2013-14	National Science Foundation, $35K *"Foundations for Trapped Molecular Ion Parity-Violation Studies"*
2011-14	National Science Foundation, $200K (Co-I portion) *CEMRI: Multifunctional Nanoscale Material Structures*
2010-13	Air Force Office of Scientific Research, YIP, $360K *"On-Demand Rotational State Preparation and Molecular Quantum Logic Spectroscopy"*
2010-12	Alfred P. Sloan Foundation, $50K
2009-14	David and Lucile Packard Foundation, $875K *"Probing Broken Symmetries Using Single-Molecule Quantum Logic Spectroscopy"*
2009-14	National Science Foundation, CAREER, $600K *"Precision Spectroscopy of milliKelvin Trapped Molecular Ions"*
2009-10	Illinois Space Grant Consortium, seed grant, $10K *"Laboratory Investigations of Space Chemistry"*

PROFESSIONAL ACTIVITY AND SERVICE

- Executive Committee Member-At-Large (elected), Topical Group on Precision Measurements and Fundamental Constants, APS, 2014-2017
- Program Committee, APS Division of Atomic, Molecular, Optical and Physics, 2014-2017
- Session Chair, Midwest Cold Atoms Workshop, Purdue University, 2013
- Co-Organizer, Molecular Ions Workshop, Georgia Tech, 2012
- Session Chair, Midwest Cold Atoms Workshop, University of Illinois, 2012
- Conference Chair, Midwest Cold Atoms Workshop, Northwestern University, 2011
- Session Chair, Midwest Cold Atoms Workshop, University of Michigan, 2010
- Panelist, National Science Foundation AMO grant proposal review, 2010
- Reviewer, National Science Foundation, Air Force Office of Scientific Research, Army Office of Research, Department of Energy, Research Corporation
- Member, American Physical Society

TEACHING

2014	Graduate Quantum Mechanics 3rd quarter, 412-3
2013	Space, Time, and Matter, 110-6, Freshman Seminar
2013	Light and Modern Physics, 125-3, Freshman Integrated Science Program series
2012	The Science of Time, 110-6, Freshman Seminar
2012	Light and Modern Physics, 125-3, Freshman Integrated Science Program series
2011	Light and Modern Physics, 125-3, Freshman Integrated Science Program series
2010	Light and Modern Physics, 125-3, Freshman Integrated Science Program series
2010	Atom Trapping and Applications, 460-0, Graduate
2009	Atom Trapping and Applications, 450-0, Graduate

OUTREACH

2014	Undergraduate quantum mechanics guest lecture, Northwestern University
2014	Society of Physics Students evening seminar, Northwestern University
2013	DAMOP outreach lecture, Quebec City
2012	Production of Doppler cooling outreach video by undergrad Lauren Ruth
2009	Society of Physics Students evening seminar, Northwestern University

GRADUATE STUDENTS AND POSTDOCS SUPERVISED

2013-	Shih-Kuang Tung, Postdoc
2013-	Matthew Dietrich, Postdoc
2013-	Mark Kokish, Graduate Student (co-supervised with Tamar Seideman, Chemistry)
2013-	Patrick Stollenwerk, Graduate Student
2010-	Ming-Feng Tu, Graduate student
2009-	Chris Seck, Graduate student
2009-	Yen-Wei Lin, Graduate student
2009-14	Chien-Yu Lien, Graduate student
2009-14	David Tabor, Graduate student
2009-12	Joan Marler, Postdoc
2009-12	Jason Nguyen, Postdoc
2008-14	Vaishnavi Rajagopal, Graduate student

CURRENT COLLABORATORS

1. Chin, Cheng. University of Chicago.
2. Brown, Ken. Georgia Tech.
3. Cote, Robin. University of Connecticut.
4. Heaven, Michael. Emory University.
5. Hudson, Eric. UCLA.
6. Ketterson, John. Northwestern University.
7. Kotochigova, Svetlana. Temple University/NIST.
8. Odom, Teri. Northwestern University.
9. Seideman, Tamar. Northwestern University.
10. Shahriar, Selim. Northwestern University.
11. Suits, Arthur. Wayne State University.

GRADUATE ADVISORS AND POSTDOCTORAL SPONSORS

1. Juan Collar, University of Chicago, postdoctoral advisor
2. Gerald Gabrielse, Harvard University, graduate advisor