

**BRIAN C. ODOM**

Northwestern University  
 Department of Physics and Astronomy  
 2145 Sheridan Road  
 Evanston, IL 60208

[b-odom@northwestern.edu](mailto:b-odom@northwestern.edu)  
 Tel: 847-467-5452  
 Fax: 847-467-6857  
<http://faculty.wcas.northwestern.edu/brian-odom>

**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**

2015 - Associate Professor, Department of Physics and Astronomy, Northwestern University  
 2008 - 15 Assistant Professor, Department of Physics and Astronomy, Northwestern University

**AWARDS AND HONORS**

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 Outstanding Thesis Award, Division of Atomic, Molecular Optical Physics, APS  
 2004 Kavli Institute Fellowship, University of Chicago

**PUBLICATIONS**

1. "[Doppler Amplification of Motion of a Trapped Three-Level Ion](#)," X. Chen, Y.-W. Lin, and B.C. Odom, *New J. Phys.* 17, 043037 (2015)
2. "[Note: High Density Pulsed Molecular Beam for Cold Ion Chemistry](#)," M.G. Kokish, V. Rajagopal, J.P. Marler, and B.C. Odom, *Rev. Sci. Instrum.* 85, 08611 (2014)
3. "[Broadband Optical Cooling of Molecular Rotors from Room Temperature to the Ground State](#)," C.-Y. Lien, C.M. Seck, Y.-W. Lin, J.H.V. Nguyen, D.A. Tabor, B.C. Odom, *Nat. Commun.* 5, 4783 (2014)
4. "[Rotational State Analysis of AlH<sup>+</sup> 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)
5. "[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)
6. "[Suitability of linear quadrupole ion traps for large Coulomb crystals](#)," D. Tabor, V. Rajagopal, Y.-W. Lin, and B. Odom. *Appl. Phys. B.* 107, 1097 (2012)
7. "[Optical pulse-shaping for internal cooling of molecules](#)," C.-Y. Lien, S. Williams, and B. Odom. *Phys. Chem. Chem. Phys.*, 13, 18825 (2011)
8. "[Challenges of laser-cooling molecular ions](#)," J.H.V. Nguyen, C.R. Viteri, E.G. Hohenstein, C.D. Sherrill, K.R. Brown, and B. Odom. *New J. Phys.* 13, 063023 (2011)

9. "[Prospects for Doppler cooling of three-electronic-level molecules](#)," J.H.V. Nguyen, and B. Odom. *Phys. Rev. A* 83, 053404 (2011)
10. "[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. Odom, E. Ramberg, J. Rasmussen, N. Riley, A. Sonnenschein, M. Szydagis, and R. Tschirhart. *Science* 319, 933 (2008)
11. "[Identification of Weakly Interacting Massive Particles Through a Combined Measurement of Axial and Scalar Couplings](#)," G. Bertone, D.G. Cerdeno, J.I. Collar, and B. Odom. *Phys. Rev. Lett.* 99, 151301 (2007)
12. "[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. Odom, K. O'Sullivan, R. Plunkett, E. Ramberg, A. Raskin, A. Sonnenschein, and J.D. Vieira. *Nucl. Instrum. Meth. A* 577, 569 (2007)
13. "[New Measurement of the Electron Magnetic Moment Using a One-Electron Quantum Cyclotron](#)," B. Odom, D. Hanneke, B. D'Urso, and G. Gabrielse. *Phys. Rev. Lett.* 97, 030801 (2006)
14. "[New Determination of the Fine Structure Constant from the Electron  \$g\$  Value and QED](#)," G. Gabrielse, D. Hanneke, T. Kinoshita, M. Nio, and B. Odom. *Phys. Rev. Lett.* 97 030802 (2006)
15. "[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. 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)
16. "[Single-Particle Self-excited Oscillator](#)," B. D'Urso, R. Van Handel, B. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 94, 113002 (2005)
17. "[COUPP, A Heavy-Liquid Bubble Chamber for WIMP Detection](#)," J. Bolte, J.I. Collar, M. Crisler, D. Holmgren, D. Nakazawa, B. Odom, K. O'Sullivan, R. Plunkett, E. Ramberg, A. Raskin, A. Sonnenschein, J.D. Vieira. *Proceedings from IDM2004*, Edinburgh, Scotland (2004)
18. "[Feedback Cooling of a One-Electron Oscillator](#)," B. D'Urso, B. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 90, 043001 (2003)
19. "[One-Electron Cyclotron \(and Implications for Cold Antihydrogen\)](#)," G. Gabrielse, S. Peil, B. 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)
20. "[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)
21. "[Quantum Interference in Electron Collision](#)," R. Liu, B. Odom, Y. Yamamoto, and S. Tarucha. *Nature* 391, 6664 (1998)

#### INVITED PRESENTATIONS

- |      |   |
|------|---|
| 2015 | Purdue University, AMO Seminar, West Lafayette, IN                          |
| 2015 | 12 <sup>th</sup> US-Japan Seminar on Many Body Quantum Systems, Madison, WI |
| 2015 | Fermilab, Colloquium, Batavia, IL   |
| 2015 | Gordon Research Conference, Newport, RI                                     |
| 2015 | APS March Meeting, San Antonio, TX  |
| 2014 | Midwest Cold Atoms Conference, Argonne National Lab, Argonne, IL            |

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, CAPP 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 6<sup>th</sup> 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

#### 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"*  
 Co-Investigators: Eric Hudson (PI, UCLA), Ken Brown, Robin Cote, Michael Heaven, Svetlana Kotochigova, Arthur Suits  
 2014-17 National Science Foundation, \$510K  
*"Single-Molecule Fluorescence Imaging and Entanglement"*  
 2014-17 National Science Foundation, \$200K (Co-I portion)  
*"CEMRI: Multifunctional Nanoscale Material Structures"*  
 PI: Mark Hersam  
 2013-16 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

- Chair, DAMOP Program Subcommittee on Cold Gases, 2015-16
- Member at Large, APS Topical Group on Precision Measurement & Fundamental Constants, 2014-16
- Participant, DAMOP Sorter's Meeting, 2015
- Session Chair, International Conference on Atomic Physics (ICAP), 2014
- 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, multiple years
- Reviewer, National Science Foundation, Air Force Office of Scientific Research, Army Office of Research, Department of Energy, Research Corporation
- Reviewer, Physical Review Letters, Physical Review A, New Journal of Physics, Reviews of Scientific Instruments, Nano Letters
- Member, American Physical Society

## DEPARTMENTAL AND UNIVERSITY SERVICE

- |           |   |
|-----------|---|
| 2015-     | Member, Thesis Committee, Dan Baxter                                  |
| 2015-16   | Director of Graduate Studies, Physics & Astronomy Department          |
| 2015-2016 | Member, Junior Faculty Search Committee, IIN/MSE Department           |
| 2014      | Member, Vision Committee, Physics & Astronomy Department              |
| 2014-15   | Member, Heilborn Lecture Committee, Physics & Astronomy Department    |
| 2014-15   | Member, Graduate Curriculum Committee, Physics & Astronomy Department |
| 2013-14   | Member, Alumni Relations Committee                                    |
| 2013-14   | Member, Heilborn Lecture Committee                                    |
| 2013-14   | Member, Thesis Committee, Laszlo Frazer                               |
| 2012-13   | Member, Heilborn Lecture Committee                                    |
| 2012 -    | Organizer, Atomic, Molecular and Optical Physics Seminar Series       |
| 2011-15   | Member, Thesis Committee, Joseph Sklenar                              |
| 2011-12   | Chair, Admissions Committee   |
| 2011-12   | Member, Goldwater Fellows (University) Committee                      |
| 2010-11   | Chair, Admissions Committee   |
| 2010-11   | Member, Graduate Curriculum Committee                                 |
| 2010-11   | Member, Faculty Search Committee, Optical Condensed Matter            |
| 2009-10   | Faculty Fellow, Public Affairs Residential College                    |
| 2009-10   | Member, Admissions Committee  |
| 2009-10   | Member, Faculty Search Committee, Theoretical Quantum Manipulation    |
| 2009-10   | Editor, Departmental Newsletter                                       |

- 2009-10 Member, Heilborn Lecture Committee
- 2009-10 Member, Thesis Committee, Monica Patel
- 2009 Judge, Undergraduate Research Symposium
- 2009- Initiator/convener of champagne toast for faculty awards, a continuing tradition
- 2008-9 Producer, Departmental Newsletter
- 2008-9 Member, Admissions Committee
- 2008-9 Member, Heilborn Lecture Committee

## TEACHING

- 2015 Atomic and Molecular Trapping and Cooling, 460-0, Graduate
- 2014 Space, Time, and Matter, 110-6, Freshman Seminar
- 2014 Graduate Quantum Mechanics 3<sup>rd</sup> 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
- 2010 Society of Physics Students evening seminar, Northwestern University
- 2009 Society of Physics Students evening seminar, Northwestern University

## RESEARCH PERSONNEL SUPERVISED

- 2015- Pinrui Shen, Masters Student
- 2015- Joseph Cordero-Mercado, PhD Student
- 2015- Panpan Huang, PhD Student
- 2013- Zeke Tung, Postdoc
- 2013-15 Matthew Dietrich, Research Assistant Professor  
Immediate placement: Tenure track Assistant Physicist position, Argonne National Lab
- 2013- Mark Kokish, PhD Student (co-supervised with Tamar Seideman, Chemistry)
- 2013- Patrick Stollenwerk, PhD Student
- 2010- Ming-Feng Tu, PhD Student
- 2009- Chris Seck, PhD Student
- 2009- Yen-Wei Lin, PhD Student
- 2009-14 David Tabor, PhD Student
- 2009-14 Chien-Yu Lien, PhD Student

2009-12      Immediate placement: Systems Engineer, Intel  
Joan Marler, Postdoc  
Immediate placement: Assistant Professor at Clemson University

2009-12      Jason Nguyen, Postdoc  
Immediate placement: Postdoc with Randy Hulet, Rice University  
Vaishnavi Rajagopal, PhD Student

2008-14      Immediate placement: Postdoc with Alessandra Ferzoco, Rowland Institute, Harvard

#### **CURRENT COLLABORATORS**

1. Ken Brown, Georgia Tech
2. Robin Cote, University of Connecticut
3. Michael Heaven, Emory University
4. Eric Hudson, UCLA
5. Svetlana Kotochigova, Temple University/NIST
6. Teri Odom, Northwestern University
7. Arthur Suits, Wayne State University