

**BRIAN C. ODOM**

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 Department of Physics and Astronomy  
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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**

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. "[Cooling of a Zero-Nuclear-Spin Molecular Ion to a Selected Rotational State](#)," P.R. Stollenwerk, I.O. Antonov, S. Venkataramanababu, Y.-W. Lin, and B.C. Odom. *arXiv:2005.06638 [physics.atom-ph]* (2020)
2. "[IP determination and 1+1 REMPI spectrum of SiO at 210-220 nm with implications for SiO<sup>+</sup> ion trap loading](#)," P.R. Stollenwerk, I.O. Antonov, and B.C. Odom. *J. Mol. Spectrosc.* 335, 40 (2019)
3. "[Prospects for Polar Molecular Ion Optical Probe of Varying Proton-Electron Mass Ratio](#)," M.G. Kokish, P.R. Stollenwerk, M. Kajita, and B.C. Odom. *Phys. Rev. A* 98, 052513 (2018)
4. "[Optical Pumping of TeH<sup>+</sup>: Implications for the Search for Varying  \$m\_p/m\_e\$](#) ," P.R. Stollenwerk, M.G. Kokish, A.G.S. de Oliveira-Filho, F.R. Ornellas, and B.C. Odom. *Atoms* 6, 53 (2018)
5. "[Enabling Lasing Action in Hybrid Atomic-Nanophotonic Integrated Structures](#)," H. Alaeian, B.C. Odom, J. Bravo-Abad, *Ann. Phys. (Berlin)* 530, 1800203 (2018)
6. "[Electronic spectroscopy of a cold SiO<sup>+</sup> sample: Implications for optical pumping](#)," P.R. Stollenwerk, B.C. Odom, D. L. Kokkin, and T. Steimle. *J. Mol. Spectrosc.* 332, 26 (2017)
7. "[Noise reduction of a Libbrecht-Hall style current driver](#)," C.M. Seck, P.J. Martin, E.C. Cook, B.C. Odom, and D.A. Steck. *Rev. Sci. Inst.* 87, 064703 (2016)
8. "[Raman sideband cooling of a <sup>138</sup>Ba<sup>+</sup> ion using a Zeeman interval](#)," C.M. Seck, M.G. Kokish, M.R. Dietrich, and B.C. Odom. *Phys. Rev. A* 93, 053415 (2016)

9. ["Trapped ion chain thermometry and mass spectrometry through imaging,"](#) V. Rajagopal, J. P. Marler, M.G. Kokish, and B. C. Odom. *Eur. J. Mass Spectrom.* 22, 1 (2016)
10. ["Simple and Compact Nozzle Design for Laser Vaporization Sources,"](#) M.G. Kokish, M.R. Dietrich, and B. C. Odom. *J. Phys. B: At. Mol. Opt. Phys.* 49, 035301 (2016)
11. ["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)
12. ["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)
13. ["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)
14. ["Rotational State Analysis of  \$\text{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)
15. ["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)
16. ["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)
17. ["Optical pulse-shaping for internal cooling of molecules,"](#) C.-Y. Lien, S. Williams, and B. Odom. *Phys. Chem. Chem. Phys.*, 13, 18825 (2011)
18. ["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)
19. ["Prospects for Doppler cooling of three-electronic-level molecules,"](#) J.H.V. Nguyen, and B. Odom. *Phys. Rev. A* 83, 053404 (2011)
20. ["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)
21. ["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)
22. ["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)
23. ["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)
24. ["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)
25. ["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)

26. "[Single-Particle Self-excited Oscillator](#)," B. D'Urso, R. Van Handel, B. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 94, 113002 (2005)
27. "[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)
28. "[Feedback Cooling of a One-Electron Oscillator](#)," B. D'Urso, B. Odom, and G. Gabrielse. *Phys. Rev. Lett.* 90, 043001 (2003)
29. "[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)
30. "[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)
31. "[Quantum Interference in Electron Collision](#)," R. Liu, B. Odom, Y. Yamamoto, and S. Tarucha. *Nature* 391, 6664 (1998)

#### INVITED PRESENTATIONS

- 2019 Many-body Physics with Cold Ion, ITAMP, Cambridge, MA
- 2019 North American Conference on Trapped Ions, University of Maryland, MD
- 2019 Program Review, AFOSR, Washington, D.C.
- 2019 Argonne National Laboratory, Colloquium, Lemont, IL
- 2018 European Conference on Trapped Ions, Rehovot, Israel
- 2018 Midwest Cold Atoms Workshop, Champaign, IL
- 2017 BSM in Direct, Indirect and Tabletop Experiments, Rehovot, Israel
- 2017 Midwest Cold Atoms Conference, Ann Arbor, MI
- 2017 Cold Molecular Ions Workshop, Les Houches, France
- 2017 Georgia State University, Colloquium, Atlanta, GA
- 2017 University of Michigan, AMO Seminar, Ann Arbor, MI
- 2016 American Chemical Society conference, Philadelphia, PA
- 2016 Michigan State University, Condensed Matter Seminar, East Lansing, MI
- 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, 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 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

### PROFESSIONAL ACTIVITY AND SERVICE

- Faculty Member, Center for Fundamental Physics, Northwestern University
- Member; American Physical Society
- Grant Reviewer; National Science Foundation, Air Force Office of Scientific Research, Army Office of Research, Department of Energy, Research Corporation
- Manuscript Reviewer; Nano Letters, Nature, New Journal of Physics, Physical Review A, Physical Review Letters, Reviews of Scientific Instruments
- Member; DAMOP Program Subcommittee on Precision Measurements, 2016-17
- Session Chair; DAMOP 2016, Providence, RI
- Sorter; DAMOP Sorter's Meeting, 2016
- Chair; DAMOP Program Subcommittee on Cold Gases, 2015-16
- Member at Large; APS Topical Group on Precision Measurement & Fundamental Constants, 2014-16
- Session Chair; DAMOP 2015, Columbus, OH
- Sorter; DAMOP Sorter's Meeting, 2015
- Panelist; National Science Foundation AMO grant proposal review, 2015
- Member; DAMOP Program Subcommittee on Quantum Information Processing, 2014-15
- 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, 2009

### DEPARTMENTAL AND UNIVERSITY SERVICE

- 2017-19 Member; Center for Fundamental Physics Faculty Search Committee
- 2017-18 Co-chair; Department Tenure Committee

2016-20 Inaugural Faculty Director; Northwestern University Research Shops  
 2015-16 Chair; Graduate Curriculum Committee, Physics & Astronomy Department  
 2015-20 Director of Graduate Studies; Physics & Astronomy Department  
 2014-18 Member; Thesis Committee, Wenchao Xu, UIUC  
 2016-17 Member; Center for Fundamental Physics Faculty Search Committee  
 2015-16 Member; Junior Faculty Search Committee, IIN/MSE Department  
 2015-16 Member; Thesis Committee, Dan Baxter  
 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  
 2012-16 Organizer; Atomic, Molecular and Optical Physics Seminar Series  
 2012-16 Member; Thesis Committee, Resham Sarkar  
 2011-15 Member; Thesis Committee, May Kim  
 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; Departmental 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

2019 Graduate Quantum Mechanics 1<sup>st</sup> quarter, 412-1  
 2018 Graduate Quantum Mechanics 1<sup>st</sup> quarter, 412-1  
 2017 Graduate Quantum Mechanics 1<sup>st</sup> quarter, 412-1  
 2016 Graduate Quantum Mechanics 1<sup>st</sup> quarter, 412-1  
 2016 Light and Modern Physics, 125-3, Freshman Integrated Science Program series  
 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

2017 Volunteer Speaker: High Jump's Career Show & Tell, for Chicago area middle schools  
 2016 Host: School of the Art Institute class tour of laser laboratory  
 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

2019- Nia Burrell, PhD Student  
 2019- Carissa Skye, Masters Student  
 2019-20 Jiafeng Cui, Postdoc  
 Immediate placement: Postdoc with Phil Richerme, Indiana University Bloomington  
 2018-19 Schuyler Kain, Postdoc  
 Immediate placement: Postdoc with Jerry Gabrielse, Northwestern University  
 2018- Sruthi Venkataramanababu, PhD Student  
 2016- Ivan Antonov, Postdoc  
 2016- James Dragan, PhD Student  
 2016-18 Jacob Johansen, Postdoc  
 Immediate placement: Research Scientist at Honeywell  
 2015-17 Vincent Carrat, Postdoc  
 Immediate placement: Laser Engineer at Lumibird  
 2015-17 Hadiseh Alaeian, Postdoc  
 Immediate placement: Humboldt Fellowship with Telman Pfau, MPI, Stuttgart  
 2015-16 Pinrui Shen, Masters Student  
 Immediate placement: Physics PhD program at UBC  
 2013-16 Zeke Tung, Postdoc  
 Immediate placement: Assistant Professor National Tsing Hua University, Taiwan  
 2013-15 Matthew Dietrich, Research Assistant Professor  
 Immediate placement: Tenure track Assistant Physicist position, Argonne National Lab  
 2013-18 Mark Kokish, PhD Student (co-supervised with Tamar Seideman, Chemistry)

2013-20 Immediate placement (Honeywell)  
Patrick Stollenwerk, PhD Student  
Immediate placement: Postdoc with ATTA, Argonne National Lab

2010-16 Ming-Feng Tu, PhD Student  
Immediate placement: Transfer to Bostedt research group

2009-16 Chris Seck, PhD Student  
Immediate placement: Physicist at Georgia Tech Research Institute

2009-16 Yen-Wei Lin, PhD Student  
Immediate placement: Postdoc with Kang-Kuen Ni at Harvard University

2009-14 David Tabor, PhD Student  
Immediate placement: Novantas

2009-14 Chien-Yu Lien, PhD Student  
Immediate placement: Systems Engineer, Intel

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

2009-12 Jason Nguyen, Postdoc  
Immediate placement: Postdoc with Randy Hulet, Rice University

2008-14 Vaishnavi Rajagopal, PhD Student  
Immediate placement: Postdoc with Alessandra Ferzoco, Rowland Institute, Harvard

#### **CURRENT COLLABORATORS**

1. Antonio G. S. de Oliveira-Filho, Universidade de São Paulo
2. Ana Paula de Lima Batista, Universidade de São Paulo
3. Fernando R. Ornellas, Universidade de São Paulo