

**Curriculum Vitae**  
**Jack Gwynne Emmet Harris**

Department of Physics, Yale University  
217 Prospect St  
New Haven, CT 06520

Phone: (203) 432-3826  
Fax: (203) 432-6175  
Email: jack.harris@yale.edu

**Education**

Ph.D.: University of California, Santa Barbara, Physics, December 2000.  
Thesis: High Sensitivity Magnetization Studies of Semiconductor Heterostructures.  
Advisor: Professor David D. Awschalom.  
A.B.: Cornell University, Physics, May, 1994.

**Employment**

*2009-Present* Associate Professor, Yale University Departments of Physics and Applied Physics.  
*2004-2009* Assistant Professor, Yale University Departments of Physics and Applied Physics.  
*2001-2004* Postdoctoral Researcher, Harvard/MIT Center for Ultracold Atoms.  
Advisors: John Doyle and Wolfgang Ketterle.  
*1994-2000* Research Assistant, UCSB Physics Department.

**Awards and Honors**

APS Fellow (Division of Atomic, Molecular, and Optical Physics), 2016.  
Arthur Greer Memorial Prize, 2009.  
DARPA Young Faculty Award, 2009.  
Yale University Junior Faculty Fellowship, 2008.  
Sloan Research Fellowship, 2007.

**Professional Activities**

*Reviewer for funding agencies:* Department of Defense, Department of Energy, European Research Council, Louisiana Board of Regents, National Science Foundation, Research Corporation for Science Advancement, Swiss National Science Foundation, Canada Foundation for Innovation, French National Research Agency.

*Referee for journals:* Science, Nature, Nature Physics, Nature Photonics, Nature Nanotechnology, Nature Communications, Proceedings of the National Academy of Sciences, Physical Review Letters, Physical Review X, Physical Review A, Physical Review B, Europhysics Letters, Applied Physics Letters, Optica, Optics Express, Applied Optics, Journal of the Optical Society of America B, Journal of Optics, Journal of Applied Physics, Review of Scientific Instruments.

*Lecturer, Warrior Scholar Project (2015 – 2016).*

*Chair*, Edward Bouchet Commemoration Committee, leading to the designation of an APS Historic Site (2015).

*Editor*, special issue of *Annalen der Physik* “Quantum and Hybrid Mechanical Systems: From Fundamentals to Applications” (2015)

*Organizing Committee*, Workshop on Quantum Opto- and Nano-Mechanics, Ecole de Physique des Houches, Les Houches, France (2015).

*Judge*, New Haven Public Schools Science Fairs (2007, 2010 – 2012, 2015).

*Member*, Defense Science Study Group (2012 – 2013).

*Speaker*, Yale Engineering and Science Master Class, undergraduate recruitment weekend (2012 – 2013).

*Organizing Committee*, Symposium on the Pressure of Light, held to celebrate the designation of the Wilder Laboratory at Dartmouth as an APS Historic Site (2012).

*Organizing Committee*, Yale Physics Olympics (2009 – 2012).

*Organizing Committee*, 17<sup>th</sup> Annual German-American Kavli Frontiers of Science Symposium, sponsored by the Alexander von Humboldt Foundation and the U.S. National Academy of Sciences (2010).

*Organizer*, Yale Physics Department’s Small Colleges Speaker Program (2006 – 2010).

*Organizer & Chair*, Gordon Research Conference on “Mechanical Systems in the Quantum Regime” (2008).

## **Publications**

A. D. Kashkanova, A. B. Shkarin, C. D. Brown, N. E. Flowers-Jacobs, L. Childress, S. W. Hoch, L. Hohmann, K. Ott, J. Reichel, J. G. E. Harris, *Photothermal optomechanics in superfluid helium coupled to a fiber-based cavity*, *Journal of Optics* **19**, 034001 (2017).

A. D. Kashkanova, A. B. Shkarin, C. D. Brown, N. E. Flowers-Jacobs, L. Childress, S. W. Hoch, L. Hohmann, K. Ott, J. Reichel, J. G. E. Harris, *Superfluid Brillouin optomechanics*, *Nature Physics* **13**, 74 (2017).

I. Petkovic, A. Lollo, L. I. Glazman, J. G. E. Harris, *Measurement of the winding number instability in mesoscopic superconducting rings*, *Nature Communications* **7**, 13551 (2016).

H. Xu, D. Mason, L. Jiang, J. G. E. Harris, *Topological energy transfer in an optomechanical system with an exceptional point*, *Nature* **537**, 80 (2016).

M. Underwood, D. Mason, D. Lee, H. Xu, L. Jiang, A. B. Shkarin, K. Børkje, J. G. E. Harris, *Measurement of the motional sidebands of a nanogram-scale oscillator in the quantum regime*, *Physical Review A* **92**, 061801(R) (2015).

- D. Lee, M. Underwood, D. Mason, A. B. Shkarin, S. W. Hoch, and J. G. E. Harris, *Multimode optomechanical dynamics in a cavity with avoided crossings*, Nature Communications **6**, 6232 (2015).
- D. Q. Ngo, I. Petkovic, A. Lollo, M. A. Castellanos-Beltran, and J. G. E. Harris, *Fabrication and characterization of large arrays of mesoscopic gold rings on large-aspect-ratio cantilevers*, Review of Scientific Instruments **85**, 105001 (2014).
- A. B. Shkarin, N. E. Flowers-Jacobs, S. W. Hoch, A. D. Kashkanova, C. Deutsch, J. Reichel, J. G. E. Harris, *Optically Mediated Hybridization Between Two Mechanical Modes*, Physical Review Letters **112**, 013602 (2014).
- J. G. E. Harris, *An introduction to laser cooling optomechanical systems*, in Quantum Machines: Measurement and Control of Engineered Quantum Systems, Lecture Notes of the Les Houches Summer School **96**, Oxford University Press (2014).
- M. A. Castellanos-Beltran, D. Q. Ngo, W. E. Shanks, A. B. Jayich, J. G. E. Harris, *Measurement of the Full Distribution of the Persistent Current in Normal-Metal Rings*, Physical Review Letters **110**, 156801 (2013).
- A. M. Jayich, J. C. Sankey, K. Børkje, D. Lee, C. Yang, M. Underwood, L. Childress, A. Petrenko, S. M. Girvin, J. G. E. Harris, *Cryogenic Optomechanics with a  $Si_3N_4$  Membrane and Classical Laser Noise*, New Journal of Physics **14**, 115018 (2012).
- S. D. Bennett, S. Kolkowitz, Q. P. Unterreithmeier, P. Rabl, A. C. Bleszynski Jayich, J. G. E. Harris, M. D. Lukin, *Measuring mechanical motion with a single spin*, New Journal of Physics **14**, 125004 (2012).
- N. E. Flowers-Jacobs, S. W. Hoch, J. C. Sankey, A. Kashkanova, A. M. Jayich, C. Deutsch, J. Reichel, and J. G. E. Harris, *Fiber-cavity-based optomechanical device*, Applied Physics Letters **101**, 221109 (2012).
- S. Kolkowitz, Ania C. Bleszynski Jayich, Q. Unterreithmeier, Steven D. Bennett, Peter Rabl, J. G. E. Harris, Mikhail D. Lukin, *Coherent sensing of a mechanical resonator with a single-spin qubit*, Science **335**, 1603 (2012).
- C. H. Bui, J. Zheng, S. W. Hoch, L. Y. T. Lee, J. G. E. Harris, C. W. Wong, *High-Reflectivity, High- $Q$  Micromechanical Membranes Via Guided Resonances for Enhanced Optomechanical Coupling*, Applied Physics Letters **100**, 021110 (2012).
- O. Entin-Wohlman, H. Bary-Soroker, A. Aharony, Y. Imry, J. G. E. Harris, *Normal persistent currents in proximity-effect bilayers*, Physical Review B **84**, 184519 (2011).
- A. Nunnenkamp, K. Børkje, J. G. E. Harris, S. M. Girvin, *Cooling and squeezing via quadratic optomechanical coupling*, Physical Review A **82**, 021806(R) (2010).

- J. C. Sankey, C. Yang, B. M. Zwickl, A. E. Jayich, J. G. E. Harris, *Strong and tunable nonlinear optomechanical coupling in a low-loss system*, Nature Physics **6**, 707 (2010).
- P. Rabl, S. J. Kolkowitz, F. H. Koppens, J. G. E. Harris, P. Zoller, M. D. Lukin, *A quantum spin transducer based on nano electro-mechanical resonator arrays*, Nature Physics **6**, 602 (2010).
- K. Børkje, A. Nunnenkamp, B. M. Zwickl, C. Yang, J. G. E. Harris, S. M. Girvin, *Observability of radiation pressure shot noise*, Physical Review A **82**, 013818 (2010).
- Aashish Clerk, Florian Marquardt, J. G. E. Harris, *Quantum measurements of phonon shot noise*, Physical Review Letters **104**, 213603 (2010). [Selected as an Editor's Suggestion]
- Eran Ginossar, Leonid I. Glazman, Teemu Ojanen, Felix von Oppen, W. E. Shanks, A. C. Bleszynski-Jayich, J. G. E. Harris, *Persistent currents in a strong magnetic field*, Physical Review B **81**, 155448 (2010) [selected as an Editor's Suggestion].
- Georg Heinrich, J. G. E. Harris, Florian Marquardt, *The photon shuttle: Landau-Zener-Stueckelberg dynamics in an optomechanical system*, Physical Review A (Rapid Communication) **81**, 011801(R) (2010).
- A. C. Bleszynski-Jayich, W. E. Shanks, B. Peaudecerf, E. Ginossar, F. von Oppen, L. Glazman, J. G. E. Harris, *Persistent currents in normal metal rings*, Science **326**, 272 (2009).
- J. C. Sankey, A. M. Jayich, B. M. Zwickl, C. Yang, J. G. E. Harris, *Improved position-squared measurements using degenerate cavity modes*, Proceedings of the XXI International Conference on Atomic Physics, World Scientific (Singapore) (2009).
- A. C. Bleszynski-Jayich, W. E. Shanks, R. Ilic, J. G. E. Harris, *High sensitivity cantilevers for measuring persistent currents in normal metal rings*, Journal of Vacuum Science and Technology B, **26**, 1412 (2008). [Selected to appear in the Virtual Journal of Nanoscale Science & Technology, August 25, 2008]
- A. M. Jayich, J. C. Sankey, B. M. Zwickl, C. Yang, J. D. Thompson, S. M. Girvin, Florian Marquardt, Aashish Clerk, J. G. E. Harris, *Dispersive optomechanics: a membrane inside a cavity*, New Journal of Physics **10**, 095008 (2008).
- J. G. E. Harris, *Traps for nearly untrappable particles*, Review of Scientific Instruments (invited Perspective article) **79**, 030901 (2008). [Selected to appear in the Virtual Journal of Applications of Superconductivity, April 1, 2008]
- J. D. Thompson, B. M. Zwickl, A. M. Jayich, Florian Marquardt, S. M. Girvin, J. G. E. Harris, *Strong dispersive coupling of a high finesse cavity to a micromechanical membrane*, Nature **452**, 72 (2008).
- J. G. E. Harris, A. M. Jayich, B. M. Zwickl, C. Yang, J. C. Sankey, *Linear optical properties of a high-finesse cavity dispersively coupled to a micromechanical membrane*, Proceedings of the SPIE **6907**, 69070E (2008).

- B. M. Zwickl, W. E. Shanks, A. E. Jayich, C. Yang, A. C. Bleszynski-Jayich, J. D. Thompson, J. G. E. Harris, *High quality mechanical and optical properties of commercial silicon nitride membranes*, Applied Physics Letters **92**, 103125 (2008).
- A. C. Bleszynski-Jayich, W. E. Shanks, J. G. E. Harris, *Noise thermometry and electron thermometry of a sample-on-cantilever system below 1 Kelvin*, Applied Physics Letters **92**, 013123 (2008). [Selected to appear in the Virtual Journal of Nanoscale Science and Technology, January 21, 2008]
- J. G. E. Harris, S. V. Nguyen, S. C. Doret, W. Ketterle, J. M. Doyle, *Spin exchange collisions of submerged shell atoms below one Kelvin*, Physical Review Letters **99**, 223201 (2007).
- J. G. E. Harris, B. M. Zwickl, A. M. Jayich, *Stable, mode-matched, medium-finesse optical cavity incorporating a micromechanical cantilever*, Review of Scientific Instruments **78**, 013107 (2007).
- Florian Marquardt, J. G. E. Harris, S. M. Girvin, *Dynamical multistability induced by radiation pressure in high-finesse micro-mechanical optical cavities*, Physical Review Letters **96**, 103901 (2006).
- J. G. E. Harris, R. A. Michniak, S. V. Nguyen, N. Brahm, W. Ketterle, J. M. Doyle, *Buffer gas trapping of weakly magnetic atoms*, Europhysics Letters **67**, 198 (2004).
- J. G. E. Harris, W. C. Campbell, D. Egorov, S. E. Maxwell, R. A. Michniak, S. V. Nguyen, L. D. van Buuren, J. M. Doyle, *Deep superconducting magnetic traps for neutral atoms and molecules*, Review of Scientific Instruments **75**, 17 (2004). [Selected to appear in the Virtual Journal of Applications of Superconductivity, January 1, 2004]
- J. G. E. Harris, R. Knobel, K. D. Maranowski, A. C. Gossard, N. Samarth, D. D. Awschalom, *Damping of micromechanical structures by paramagnetic relaxation*, Applied Physics Letters **82**, 3532 (2003).
- R. Knobel, N. Samarth, J. G. E. Harris, D. D. Awschalom, *Measurements of Landau-level crossings and extended states in magnetic two-dimensional gases*, Physical Review B **65**, 235327 (2002).
- J. G. E. Harris, D. D. Awschalom, R. Knobel, N. Samarth, K. D. Maranowski, A. C. Gossard, *Magnetization measurements of magnetic two dimensional electron gases*, Physical Review Letters **86**, 4644 (2001).
- J. G. E. Harris, D. D. Awschalom, K. D. Maranowski, A. C. Gossard, *Magnetization and dissipation measurements in the quantum Hall regime using an integrated micromechanical magnetometer*, Journal of Applied Physics **87**, 5102 (2000).
- J. G. E. Harris, D. D. Awschalom, F. Matsukura, H. Ohno, K. D. Maranowski, A. C. Gossard, *Integrated micromechanical cantilever magnetometry of  $Ga_{1-x}Mn_xAs$* , Applied Physics Letters **75**, 1140 (1999).

- J. G. E. Harris, J. E. Grimaldi, D. D. Awschalom, A. Chiolero, D. Loss, *Excess spin and the dynamics of antiferromagnetic ferritin*, Physical Review B **60**, 3453 (1999).
- J. G. E. Harris, D. D. Awschalom, *Thin films squeeze out domains*, Physics World **12**, No. 1, 19 (1999).
- K. W. Lehnert, J. G. E. Harris, S. J. Allen, N. Argaman, *Non-equilibrium superconductivity in mesoscopic Nb-InAs-Nb junctions*, Superlattices and Microstructures **25**, 839-49 (1999).
- J. G. E. Harris, N. Argaman, S. J. Allen, *Absence of Shapiro-like steps in certain mesoscopic S-N-S junctions*, Comment to Physical Review Letters **78**, 2678 (1997).
- J. G. E. Harris, D. D. Awschalom, K. D. Maranowski, A. C. Gossard, *Fabrication and characterization of 100-nm thick GaAs cantilevers*, Review of Scientific Instruments **67**, 3591 (1996).
- H. Drexler, J. G. E. Harris, E. L. Yuh, K. C. Wong, S. J. Allen, E. G. Gwinn, H. Kroemer, E. L. Hu, *Superconductivity and the Josephson effect in a periodic array of Nb-InAs-Nb junctions*, Surface Science **361-362**, 306 (1996).
- E. L. Yuh, J. G. E. Harris, T. Eckhause, K. C. Wong, E. G. Gwinn, H. Kroemer, S. J. Allen, *Far-infrared studies of induced superconductivity in quantum wells*, Surface Science **361-362**, 315 (1996).
- E. L. Yuh, J. G. E. Harris, E. G. Gwinn, S. J. Allen, K. C. Wong, H. Kroemer, E. L. Hu, *Far-infrared studies of InAs quantum wells with Nb electrodes*, Proceedings of the Seventh International Conference on Narrow Gap Semiconductors. IOP Publishing, 1995, p. 379-83.
- J. G. E. Harris, *The trapping of ions at SPEAR: A computational and experimental study*, SLAC-PUB 6474, 1994.

### **Coverage in general and trade publications**

- Pro-physik.de: “*Suprafluide Optomechanik*” October 4, 2016.
- Nature Physics: “*News & Views: circling exceptional points*” vol. 12, p. 823, 2016.
- Austria Press Agentur: “*Die Ausnahme und ihre Reglen*” July 27, 2016
- Phys.Org: “*Building a Moebius strip of good vibrations*” July 25, 2016.
- Yale News: “*Honoring Edward Bouchet and the original Sloane Laboratory, where he studied*” February 29, 2016.
- Yale Scientific Magazine: “*Yale Professor wins Keck Grant: Probing the Boundary Between Quantum and Classical*” October 3, 2015.
- Yale News: “*Opening a window on quantum gravity*” March 17, 2015.
- Yale Scientific Magazine: “*One of the many quirks of quantum*” May 1, 2012.

Science Magazine: “*A single spin feels the vibrations*”, volume 335, p. 1584 (2012).

UCSB Daily Nexus: “*UCSB Research May Aid Development of New MRI and Quantum Technology*”, March 6, 2012.

Science News: “*Moved by Light*”, p. 24, May 7, 2011.

Yale Scientific Magazine: “*Quantum mechanics on the macroscale*” September 1, 2010.

Tagesspiegel-Beilage der Freien Universität Berlin, “*Straum aus dem Nichts*” p. 4, December 19, 2009.

La Recherche, “*Courant perpétuelle*” p. 14, December 2009.

Physics Today: “*Sensitive cantilevers detect the persistent currents in normal metal rings*” p. 17, December 2009.

Physik Journal: “*Dauerströme im Kreisverkehr*” p.22, iss. 12, vol. 8 (2009).

Yale Alumni Magazine: “*Noted*” p.28, Nov/Dec, 2009.

Physics World Online: “*Electrons flow forever in metal rings*”  
<http://physicsworld.com/cws/article/news/40665>

Yale Daily News: “*Prizes fund research for junior professors*” p.10, November 16, 2009.

Nature Physics: “*Research Highlights: Catch the Wave*” p. 779, November 2009.

Yale Daily News: “*A new look at electrons*” p.6, October 14, 2009.

Slashdot: “*Yale physicists measure persistent current*”  
[http://hardware.slashdot.org/story/09/10/10/1338210/Yale-Physicists-Measure-Persistent-Current?art\\_pos=7](http://hardware.slashdot.org/story/09/10/10/1338210/Yale-Physicists-Measure-Persistent-Current?art_pos=7)

Spektrum der Wissenschaften (German edition of Scientific American): “*Verlustfreier Strom in gewöhnlichem Metallring*”, <http://www.wissenschaft-online.de/artikel/1010414>.

Science Magazine: “*Sensing a small but persistent current*” volume 326, 244 (2009).

Science Magazine: “*Normally Persistent*” volume 326, 202 (2009).

Science magazine podcast interview: “*Persistent currents in normal metal rings*”  
<http://www.sciencemag.org/content/vol326/issue5950/images/data/272/DC2/272.mp3>

Yale University podcast: “*Exploring the force of light*” <http://itunes.yale.edu/>, January 2009.

Optics & Photonics Focus: “*Visible and Entangled*” December 4, 2008.

Yale Daily News: “*Leaks from the lab*” December 3, 2008.

Yale Bulletin: “*Yale scientist Jack Harris named among Discover’s ‘20 Under 40’*” November 21, 2008.

Discover Magazine: “*Top 20 scientists under 40*” p. 28, December 2008.

Physical Review Focus: “*Schrödinger’s Drum*” November 11, 2008.

Photonics Spectra: “*Unique cavity demonstrates highest optomechanical coupling*” p. 87, May 2008.

### **Invited Presentations**

“*Topological physics with a pair of oscillators: beyond Berry’s phase via exceptional points*” Physics Department Colloquium, University of California, Santa Barbara, CA, 2017.

“*Topological physics with a pair of oscillators: beyond Berry’s phase via exceptional points*” Physics Department Colloquium, USC, Los Angeles, CA, 2017.

“*Topological physics with a pair of oscillators: beyond Berry’s phase via exceptional points*” Physics Department Colloquium, SUNY Sonty Brook, NY, 2017.

“*Topological physics with a pair of oscillators: beyond Berry’s phase via exceptional points*” Condensed Matter Seminar, University of Massachusetts, Amherst, MA, 2017.

“*Observation of quantum optomechanical effects in a liquid*” Physics of Quantum Electronics, Snowbird, UT, 2017.

“*Observing quantum effects in a mm-scale object*” Physics Department Colloquium, Amherst College, Amherst, MA, 2016.

“*Measuring quantum fluctuations in a superfluid optomechanical system*” Conference on Quantum Engineering of Levitated Systems, Benasque, Spain, 2016.

“*Observing quantum effects and topological effects (although not quantum topological effects) in the motion of a millimeter-scale object*” Physics Department Colloquium, McGill University, Montréal, Canada, 2016.

“*Quantum optomechanics in a superfluid-filled optical cavity*” Gordon Research Conference on Mechanical Systems in the Quantum Regime, Ventura, CA, 2016.

“*Observing quantum effects and topological effects (although not quantum topological effects) in the motion of a millimeter-scale object*” EQUUS Annual Workshop, Benowa, Australia, 2015.

“*Superfluid Brillouin optomechanics*” EQUUS Optomechanics Incubator, Brisbane, Australia, 2015.

“*Observing quantum effects in a mm-scale object*” ITAMP/HQOC Seminar, Harvard University, Cambridge, MA, 2015.



*“Observing quantum effects in a mm-scale object”* Physics Colloquium, Duke University, Durham, NC, 2015.

*“Observing quantum effects in a mm-scale object”* Physics Colloquium, Dartmouth College, Hanover, NH, 2015.

*“Observing quantum effects in a mm-scale object”* Physics Colloquium, University of California, Los Angeles, CA, 2015.

*“Observing quantum effects in a mm-scale object”* Special Seminar, University of Chicago, Chicago, IL, 2014.

*“Observing quantum effects in a mm-scale optomechanical device”* Physics Colloquium, Queens College, NYC, NY, 2014.

*“Observation of quantum effects in a mm-scale optomechanical device”* Pittsburgh Quantum Institute Symposium, Pittsburgh, PA, 2014.

*“Quantum optomechanics with solids and superfluids”* Gordon Research Conference on Mechanical Systems in the Quantum Regime, Ventura, CA, 2014.

*“Quadratic optomechanics at 500 mK, and new approaches to quantum optomechanics”* Workshop in Frontier of Nanomechanics, ICTP, Trieste, Italy, 2013.

*“New approaches to quantum optomechanics”* International Conference on Quantum Technologies, Moscow, Russia, 2013.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, University of Missouri, Columbia, MO, 2013.

*“New approaches to quantum optomechanics”* Physics Department Colloquium, Weizmann University, Rehovot, Israel, 2013.

*“Measuring the distribution of persistent current in normal metal rings”* Condensed Matter Seminar, Weizmann University, Rehovot, Israel, 2013.

*“Measuring the distribution of persistent current in normal metal rings”* Condensed Matter Seminar, Ben Gurion University, Beer Sheeva, Israel, 2013.

*“Quantum optomechanics: towards quantum mechanics on the macro scale”* Pressure of Light Symposium, Dartmouth College, Hanover, NH, 2012.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, Amherst College, Amherst, MA, 2012.

*“Coherent sensing of a mechanical resonator with a single-spin qubit”* APS March Meeting, Boston, MA, 2012.

*“Laser cooling a cryogenic membrane-in-the-middle device”* Workshop on Quantum Control in Solid State Systems, Princeton University, Princeton, NJ, 2011.

*“Laser cooling a cryogenic membrane-in-the-middle device”* Workshop on Quantum to Classical Transition in Mechanical Systems, Leiden, Netherlands, 2011.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Yale/UCL Workshop, University College of London, London, UK, 2011.

*“Laser cooling a cryogenic membrane-in-the-middle device”* Workshop on Quantum Optics of Micro- and Nano-Mechanical Systems, Monte Verita, Switzerland, 2011.

*“Introduction to laser cooling optomechanical systems”* Les Houches Summer School on Quantum Machines, École de Physique des Houches, France, 2011.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, Penn State, State College, PA, 2011.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, Harvard University, Cambridge, MA, 2011.

*“Optomechanics as a test bed for quantum measurement”* Japanese-American Kavli Frontiers of Science Workshop, Kazusa Arc, Japan 2010.

*“Optomechanics: beyond the light mill”* Defense Sciences Research Council, Arlington VA, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, Syracuse University, Syracuse, NY, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Seminar, Bates College, Lewiston, ME, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, University of Oregon, Eugene, OR, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Condensed Matter Seminar, Princeton University, Princeton, NJ, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, Columbia University, NYC, NY, 2010.

*“The quantum mechanics of radiation pressure”* Institute for Science Instruction and Study, Southern Connecticut State College, New Haven, CT, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”* Physics Colloquium, MIT, Cambridge, MA, 2010.

*“Strong quadratic and quartic coupling in a low-loss optomechanical system”* Gordon Research Conference on Mechanical Systems in the Quantum Regime, Galveston, TX, 2010.

*“Strong quadratic and quartic coupling in a low-loss optomechanical system”* APS March Meeting, Portland, OR, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Physics Colloquium, Yale University, New Haven, CT, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Physics Colloquium, Swarthmore College, Swarthmore, PA, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Physics Colloquium, Drexel University, Drexel, PA, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Physics Colloquium, Ohio State University, Columbus, OH, 2010.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Physics Colloquium, Wesleyan University, Middletown, MA, 2010.

*“Nose reduction in LIDAR using squeezed light sources”*, Seminar, Patuxent River Naval Air Station, MD, 2009.

*“Strong quadratic and quartic coupling in a low-loss optomechanical system”* Heraeus Seminar on quantum optics of nano- and micromechanical systems, Bad Honnef, Germany, 2009.

*“Applying quantum mechanics to an entire circuit: persistent currents in a resistive metal”*  
Atomic Physics GRC, Tilton, MA, 2009.

*“Improved ‘position squared’ readout: towards observing quantum jumps in MEMS”* DAMOP, Charlottesville, VA, 2009.

*“Persistent currents in normal metals: new experimental results”* 101<sup>st</sup> Statistical Mechanics Conference, Rutgers University, New Brunswick, NJ, 2009.

*“Can an atomic orbital flow through a resistive wire?”* Physics department colloquium, Williams College, Williamstown, MA, 2009.

*“Persistent currents in normal metal rings: How wrong can Ohm’s Law be?”* Physics department colloquium, NYU, New York City, NY, 2009.

*“Improved ‘position squared’ readout: towards observing quantum jumps in MEMS”* SQuInT, Seattle, WA, 2009.

*“Persistent currents in normal metal rings: How wrong can Ohm’s Law be?”* Physics department colloquium, Caltech, Pasadena, CA, 2009.

*“Improved ‘position squared’ readout: towards observing quantum jumps in MEMS”* Physics of Quantum Electronics, Snowbird, UT, 2009.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* Joint Quantum Institute Seminar, JQI, College Park, Maryland, 2008.

*“Persistent currents in normal metal rings: How wrong can Ohm’s Law be?”* Condensed matter seminar, ETH, Zurich, Switzerland, 2008.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* Physic Department Colloquium, ETH, Zurich, Switzerland, 2008.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* Theoretical Physics Seminar, Alba Nova University, Stockholm, Sweden, 2008.

*“Persistent currents in normal metal rings: How wrong can Ohm’s Law be?”* Condensed matter seminar, NORDITA, Stockholm, Sweden, 2008.

*“Persistent currents in normal metal rings: How wrong can Ohm’s Law be?”* YINQE seminar, Yale University, CT, 2008.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* Condensed Matter Seminar, University of Illinois, Urbana-Champaign, IL, 2008.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* Workshop on Nanomechanical Systems Approaching the Quantum Regime, Ludwig Maximilians University, Munich, Germany, 2008.

*“Dispersive optomechanics: A new approach to macroscopic quantum phenomena”* International Conference on Atomic Physics, Storrs, CT, 2008.

*“Radiation pressure and micromechanics: a new route to macroscopic quantum phenomena”* Workshop on quantum phenomena and information: from atomic to mesoscopic systems, ICTP, Trieste, Italy, 2008.

*“Radiation pressure and micromechanics: a new route to macroscopic quantum phenomena”* Séminaire du Laboratoire Kastler Brossel, Ecole Normale Supérieure, Paris, France, 2008.

*“Radiation pressure and micromechanics: a new route to macroscopic quantum phenomena”* Yale University Science Forum, CT, 2008.

*“Persistent currents in normal-metal rings: a new approach”* Annual Meeting and Renewal Review of the National Nanofabrication Infrastructure Network, Stanford, CA, 2008.

*“Radiation pressure and micromechanics: a new route to macroscopic quantum phenomena”* Yale Physics Department Colloquium, CT, 2008.

*“Dispersive optomechanics: a new approach to radiation pressure”* APS March Meeting, New Orleans, LA, 2008.

*“Dispersive optomechanics: a new approach to radiation pressure”* Optics Seminar, Columbia University, NY, 2008.

*“The quantum mechanics of radiation pressure”* Physics Department Colloquium, Connecticut College, CT, 2008.

*“The quantum mechanics of radiation pressure”* Institute for Science Instruction and Study, Southern Connecticut State College, CT, 2008.

*“Dispersive optomechanics: a new approach to laser cooling”* Photonics West, San Jose, CA, 2008.

*“Dispersive optomechanics: a new approach to radiation pressure”* Special Seminar, IBM Almaden Research Facility, 2008.

*“Dispersive optomechanics: a new approach to radiation pressure”* Applied Physics Seminar, Caltech, 2008.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Physics of Quantum Electronics (Plenary Session), Snowbird, UT, 2008.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Special seminar, Institute for Quantum Optics and Quantum Information, Vienna, Austria, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* DARPA Workshop on Optomechanical Properties of Light, Arlington, VA, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Condensed Matter Seminar, McGill University, Montreal, Canada, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* CUA Seminar, Harvard/MIT Center for Ultracold Atoms, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Frontiers in Optics / Laser Science, San Jose, CA, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Condensed Matter Seminar, University of Pennsylvania, 2007.

*“Closing Remarks”* Second International Workshop on Dynamical Phenomena in NEMS and Nano-electronics, Daejeong, South Korea, 2007.

*“Strong dispersive coupling of a high finesse cavity to a micromechanical membrane”* Second International Workshop on Dynamical Phenomena in NEMS and Nano-electronics, Daejeong, South Korea, 2007.

*“Strong dispersive coupling in optomechanical systems”* Quantum Enabled Science and Technology Workshop 2007, Santa Fe, NM, 2007.

*“Strong dispersive coupling between a high finesse cavity and a micromechanical membrane”* YINQE Seminar, Yale, 2007.

*“An introduction to the quantum harmonic oscillator; or, the quantum flesh on classical bones”* NEMS Summer School, Caltech, 2007.

*“Strong dispersive coupling between a high finesse cavity and a micromechanical membrane; or, a solar sail at Symplegades”* NEMS Summer School, Caltech, 2007.

*“Strong dispersive coupling in optomechanical systems”* ITAMP Workshop on Hybrid Approaches to Scalable Quantum Information Systems, Harvard University, 2007.

“*Quantum systems coupled by harmonic modes,*” Gordon Research Conference on Quantum Information Science, Il Ciocco, Italy, 2007.

“*Thermal and quantum fluctuations in micromechanical systems*” Physics Department Colloquium, University of Nevada, Reno, 2007.

“*Thermal and quantum fluctuations in micromechanical systems*” Physics Department Colloquium, Amherst College, 2007.

“*Thermal and quantum fluctuations in micromechanical systems*” AMO Seminar, SUNY Stony Brook, 2007.

“*Thermal and quantum fluctuations in micromechanical systems*” Condensed Matter Physics Seminar, Brookhaven National Laboratory, 2007.

“*Micromechanical systems and temperature*” Workshop on Quantum Electromechanical Systems, Morro Bay, CA, 2006.

“*MEMS, radiation pressure, and temperature*” Nanophysics Seminar, Dartmouth College, 2006.

“*Quantum Optics of Radiation Pressure*” Quantum Enabled Science and Technology Workshop 2006, Santa Fe, NM, 2006.

“*Quantum Optics of Radiation Pressure*” Tutorial Session, Annual March Meeting of the American Physical Society, Baltimore, MD, 2006.

“*When is a rainbow a clock? The 2005 Nobel Prize in Physics Explained*” Physics Department Chair’s Tea, Yale University, 2005.

“*Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling*” Condensed Matter and Atomic Physics Seminar, The Pennsylvania State University, 2005.

“*Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling*” Physics Department Colloquium, Tufts University, 2005.

“*Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling*” Physics Department Colloquium, Yale University, 2004.

“*Light as a Mechanical Material*” Physics Department Colloquium, Union College, 2004.

“*Quantum Optics with Radiation Pressure*” New Laser Scientist Conference, Rochester NY, 2004.

“*Hot Topics: Recent Advances in Buffer gas Cooling*” International Conference on Atomic Physics, Rio de Janeiro, Brazil, 2004.

“*Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling*” Atomic Physics Seminar, Harvard University, 2004.

*“Landau-level crossings and paramagnetic relaxation: from the quantum Hall regime to 'spin friction' with micromechanical detectors”* Condensed Matter Seminar, University of Washington, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Physics Department Colloquium, University of Washington, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Physics Department Colloquium, UC Berkeley, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Chez Pierre Seminar, MIT, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Physics Colloquium, JILA, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* LASSP Seminar, Cornell University, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Condensed Matter Seminar, University of Minnesota, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Atomic Physics Seminar, Yale University, 2004.

*“Radiation Pressure in the Quantum Regime”* Condensed Matter Seminar, Yale University, 2004.

*“Cold Atoms Without Laser Cooling: the Frontier of Buffer-Gas Cooling”* Physics Department Colloquium, University of Colorado at Boulder, 2003.

*“Landau-level crossings and paramagnetic relaxation: from the quantum Hall regime to 'spin friction' with micromechanical detectors”* Condensed Matter Seminar, University of Colorado at Boulder, 2003.

*“Landau-level crossings and paramagnetic relaxation: from the quantum Hall regime to 'spin friction' with micromechanical detectors”* Condensed Matter Seminar, University of Minnesota, 2003.

*“Towards Buffer Gas Cooling and Magnetic Trapping of Large Numbers of Alkali Atoms”* Euroconference on Quantum Optics, San Feliu de Guixols, Spain, 2002.

*“Micromechanical Studies of Level Crossings, the Quantum Hall Effect, and Single Spins in Semiconductor Heterostructures”* Physics Seminar, National High Magnetic Field Lab, Los Alamos National Lab, 2001.

*“Micromechanical Magnetization and Dissipation Studies of Magnetic Two-Dimensional Electron Gases”* Annual March Meeting of the American Physical Society, Seattle, WA, 2001.