

# Curriculum Vitae

## Jack Gwynne Emmet Harris

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### EMPLOYMENT

*2017 - present* Professor of Physics and Applied Physics, Yale University  
*2010 - 2017* Associate Professor of Physics and Applied Physics (tenured), Yale University  
*2009 - 2010* Associate Professor of Physics and Applied Physics (untentured), Yale University  
*2004 - 2009* Assistant Professor of Physics and Applied Physics, Yale University  
*2001 - 2004* Postdoctoral Researcher, Harvard/MIT Center for Ultracold Atoms  
*Advisors:* John Doyle & Wolfgang Ketterle  
*1994 - 2000* Graduate Research Assistant, UCSB Physics Department.

### 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.

### AWARDS AND HONORS

Vannevar Bush Faculty Fellow, 2019  
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, National Science Foundation, Louisiana Board of Regents, W. M. Keck Foundation, Research Corporation for Science Advancement, John Templeton Foundation, Canada Foundation for Innovation, French National Research Agency (ANR), Swiss National Science Foundation (SNSF), European Research Council, Czech Science Foundation (GAČR), Austrian Science Fund (FWF), Dutch Research Council (NWO).

*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, AIP Advances, Annalen der Physik, New Journal of Physics, Journal of Applied Physics, Review of Scientific Instruments.

*Faculty Advisor*, QuARK (Yale Physics Department LGBTQ+ group) (2020 – present).

*Organizer*, Workshop on the Centenary of Quantum Mechanics, Helgoland, Germany (2020 – 2025)

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

*Mentor*, Research Experience for Veteran Undergraduates (2019, 2022, 2023).

*Judge*, Quantum Steampunk Short-Story Contest, Maryland Quantum Thermodynamics Hub (2023).

*Speaker*, Franke Program in Science and the Humanities, “Conceptual and Philosophical Implications of the Second Quantum Revolution” (2022).

*Speaker*, Yale Science on Saturdays (2017).

*Judge*, New Haven Public Schools Science Fairs (2007, 2010, 2011, 2012, 2015, 2017)

*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)

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

*Member*, Defense Science Study Group (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).

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

## REFEREED PUBLICATIONS

J. R. Lane, C. Guria, J. Höller, T. D. Montalvo, Y. S. S. Patil, J. G. E. Harris, *Complex Berry phase and steady-state geometric amplification in non-Hermitian systems*, ArXiv:2503.23197 (2025).

H. H. Diamandi, Y. Luo, D. Mason, T. B. Kanmaz, S. Ghosh, M. Pavlovich, T. Yoon, R. Behunin, S. Puri, J. G. E. Harris, P. T. Rakich, *Quantum optomechanical control of long-lived bulk acoustic phonons*, Nature Physics **21**, 1482-1488 (2025)

C. Guria, Q. Zhong, S.K. Ozdemir, Y.S.S. Patil, R. El-Ganainy, J.G.E. Harris, *Resolving the topology of encircling multiple exceptional points*, Nature Communications **15**, 1369 (2024).

J. Ma, Y.S.S. Patil, J. Yu, Y. Wang, J.G.E. Harris, *A proposal for detecting the spin of a single electron in superfluid helium*, ArXiv:2308.07174v1 (2023).

- C. D. Brown, Y. Wang, M. Namazi, G. I. Harris, M. T. Uysal, J. G. E. Harris *Superfluid Helium Drops Levitated in High Vacuum*, Physical Review Letters, **130**, 216001 (2023). [Selected as an Editor's Suggestion]
- Y.S.S. Patil, J. Höller, P.A. Henry, C. Guria, Y. Zhang, L. Jiang, N. Kralj, N. Read, J.G.E. Harris, *Measuring the knot of non-Hermitian degeneracies and non-commuting braids*, Nature **607**, 271–275 (2022).
- Y.S.S. Patil, J. Yu, S. Frazier, Y. Wang, K.G. Johnson, J.R. Fox, J. Reichel, J.G.E. Harris, *Measuring High-Order Phonon Correlations in an Optomechanical Resonator*, Physical Review Letters **128**, 183601 (2022).
- K. Børkje, F. Massel, J. G. E. Harris, *Nonclassical photon statistics in two-tone continuously driven optomechanics*, Physical Review A **104**, 063507 (2021).
- Daniel Carney, Gordan Krnjaic, David C. Moore, Cindy A. Regal, Gadi Afek, Sunil Bhawe, Benjamin Brubaker, Thomas Corbitt, Jonathan Cripe, Nicole Crisosto, Andrew Geraci, Sohitri Ghosh, Jack G. E. Harris, Anson Hook, Edward W. Kolb, Jonathan Kunjummen, Rafael F. Lang, Tongcang Li, Tongyan Lin, Zhen Liu, Joseph Lykken, Lorenzo Magrini, Jack Manley, Nobuyuki Matsumoto, Alissa Monte, Fernando Monteiro, Thomas Purdy, C. Jess Riedel, Robinjeet Singh, Swati Singh, Kanupriya Sinha, Jacob M. Taylor, Juehang Qin, Dalziel J. Wilson, Yue Zhao, *Mechanical quantum sensing in the search for dark matter*, Quantum Science and Technology **6**, 024002 (2021).
- J. Höller, N. Read, J.G.E. Harris, *Non-Hermitian adiabatic transport in the space of exceptional points*, Physical Review A **102**, 032216 (2020).
- I. Petkovic, A. Lollo, J. G. E. Harris, *Phase slip statistics of a single isolated flux-biased superconducting ring*, Physical Review Letters **125**, 067002 (2020).
- H. Xu, Luyao Jiang, A. A. Clerk, J. G. E. Harris, *Nonreciprocal control and cooling of phonon modes in an optomechanical system*, Nature **568**, 65 (2019).
- A. B. Shkarin, A. D. Kashkanova, C. D. Brown, S. Garcia, K. Ott, J. Reichel, J. G. E. Harris, *Quantum optomechanics in a liquid*, Physical Review Letters **122**, 153601 (2019) [Selected as an Editor's Suggestion and Featured in Physics].
- P. Kharel G. I. Harris, E. A. Kittlaus, W. H. Renninger, N. T. Otterstrom, J. G. E. Harris, P. T. Rakich, *High-frequency cavity optomechanics using bulk acoustic phonons*, Science Advances **5**, eaav05782 (2019).
- Andrea Aiello, J. G. E. Harris, Florian Marquardt, *Perturbation theory of optical resonances of deformed dielectric spheres*, Physical Review A **100**, 023837 (2019).
- H. Xu, D. Mason, Luyao Jiang, J. G. E. Harris, *Topological dynamics in an optomechanical system with highly non-degenerate modes*, ArXiv:1703.07374 (2017).
- L. Childress, M. P. Schmidt, A. D. Kashkanova, C. D. Brown, G. I. Harris, A. Aiello, F. Marquardt, J. G. E. Harris, *Cavity optomechanics in a levitated helium drop*, Physical Review A **96**, 063842 (2017).
- A. D. Kashkanova, A. B. Shkarin, C. D. Brown, N. E. Flowers-Jacobs, L. Childress, S. W. Hoch, L. Hohmann, K. Ott, S. Garcia, J. Reichel, J. G. E. Harris, *Observation of thermal fluctuations in a superfluid optomechanical system*, Proceedings of the SPIE **10116**, MOEMS and Miniaturized Systems XVI, doi:10.1117/12.2252356 (2017).

- Luyao Jiang, Haitan Xu, David Mason, J. G. E. Harris, *Topological dynamics near exceptional points in an optomechanical system*, Proceedings of the SPIE **10120**, Complex Light and Optical Forces XI, doi:10.1117/12.2250644 (2017).
- J. G. E. Harris, *Ambient quantum optomechanics*, Science **356**, 1232 (2017) [an Insights/ Perspectives review of the paper by Purdy *et al.* in the same issue].
- 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, Luyao 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).
- 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  $\text{Si}_3\text{N}_4$  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. 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. Brahms, 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.

## BOOKS & CHAPTERS

- Superfluid SBS*, with co-authors B. J. Eggleton & W. P. Bowen, in “Brillouin Scattering Part I” Semiconductors and Semimetals **109**, Benjamin J. Eggleton, Michael J. Steel, Christopher G. Poulton, eds. Elsevier (2022).
- “Quantum Optomechanics and Nanomechanics” Lecture Notes of the Les Houches Summer School **105**, Pierre-François Cohadon, Jack Harris, Florian Marquardt, and Leticia Cugliandolo, eds. Oxford University Press (2020).
- 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**, Michel Devoret, Benjamin Huard, Robert Schoelkopf, and Leticia F. Cugliandolo, eds. Oxford University Press (2014).

## COVERAGE IN GENERAL AND TRADE PUBLICATIONS

- Physics World: “*Tracing Quantum’s First Steps: Physicists Return to Helgoland*” June 26, 2025
- New Scientist: “*Searching for the past and future of quantum physics on a tiny island*” June 17, 2025
- AIP Research: “*What happened on Helgoland 100 years ago—and what didn’t?*” June 13, 2025
- Nature: “*Conference marking 100 years of quantum mechanics starts in Hamburg*” June 12, 2025
- Physics World: “*Quantum island: why Helgoland is a great spot for fundamental thinking*” June 12, 2025
- Physics World: “*Quartet of Nobel laureates sign Helgoland’s ‘gold book’*” June 10, 2025
- Physics World: “*Conference marking 100 years of quantum mechanics starts in Hamburg*” June 10, 2025
- Nature: “*Do our observations make reality happen?*”, June 9, 2025

Medium.com: *"The Allergy That Changed Physics: Heisenberg's Quantum Breakthrough on a Remote Island"* May 25, 2025

Physics Today: *"Demythologizing quantum history"* April 1, 2025

Physics World Podcast: *"Helgoland: leading physicists to gather on the tiny island where quantum mechanics was born"* January 24, 2025

Physics World: *"Return to Helgoland: the centenary of quantum mechanics"* January 2025

The New Scientist: *"Extremely cold drop of helium can be levitated forever"* June 9, 2023.

The Nerd Expansion Podcast: *"Jack Harris & Physics"* April 18, 2023.

Nature: *"The knotty problem of tuning an instrument"* July 13, 2022.

Yale News: *"Knots in the resonator: elegant math in humble physics"* July 13, 2022.

Milton Magazine: *"Looking for Quantum Signs in Everyday Life"* Spring 2022.

Yale News: *"REVU puts 'boots on the ground' to get vets research experience"* August 13, 2019.

Yale News: *"Jack Harris wins Vannevar Bush Faculty Fellowship"* May 2, 2019.

Design News: *"Making Sound Flow in Just One Direction"* April 26, 2019.

Yale Daily News: *"Researchers explore one-directional sound waves"* April 23, 2019.

SciTechDaily: *"Physicists Observe Quantum Behavior in Liquid Vibrations"* April 19, 2019

Physics: *"Quantum Optomechanics in a Liquid"* (<https://physics.aps.org/synopsis-for/10.1103/PhysRevLett.122.153601>) April 15, 2019.

Rambler.Ru: *"Физики из Йеля заставили тепло и звук двигаться только в одном направлении Об этом сообщает"* April 3, 2019.

Welt der Physik: *"Einbahnstraße für Schallwellen"* April 3, 2019.

Phys.Org: *"It's a one-way street for sound waves in this new technology"* April 3, 2019.

Yale Daily News: *"New plaque honors Edward Bouchet"* April 10, 2017.

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

*"Cavity optomechanics in levitated superfluid helium drops"* Physics of Quantum Electronics, Snowbird, UT, 2026.

*"Why 'macroscopic' matters"* Nobel Symposium on 40 Years of Macroscopic Quantum Physics, Stockholm, Sweden, 2025.

*"Testing the linearity of quantum mechanics: high-amplitude motion of a massive object"* Quantum Optics / AMO Seminar, University of Toronto, Canada, 2025.

*"Measuring the knots and braids of non-Hermitian oscillators"* Physics Colloquium, University of Toronto, Canada, 2025.

*"A crazy cavity made of helium and vacuum"* QFARM Crazy Cavity Workshop, Stanford University, Palo Alto, CA, 2025.

*"New results on magnetically levitated drops of superfluid helium"* International Conference on Low Temperature Physics, Bilbao, Spain, 2025.

*"Leveraging telecom fiber optical components to realize quantum acoustic devices"* Defense Basic Research Exchange Forum, online, 2025.

*"Superfluid Helium Drops Levitated in Ultrahigh Vacuum"* Gordon Research Conference on Cold Atoms and Molecules, Newport, RI, 2025.

*"Optomechanics in a Levitated Drop of Superfluid Helium"* CLEO, Long Beach, CA, 2025.

*"Magnetically Levitated Superfluid Helium Drops: New Results"* Micromechanics Conference, Obergurgl, Austria, 2025.

*"Magnetically Levitated Superfluid Helium Drops: New Results"* Physics of Quantum Electronics, Snowbird, UT, 2025.

*"Testing the linearity of quantum mechanics: high-amplitude motion of a massive object"* Physics Department Colloquium, Stevens Institute of Technology, Hoboken, NJ, 2024.

*"Testing the linearity of quantum mechanics: high-amplitude motion of a massive object"* Workshop on Witnessing Quantum Aspects of Gravity in a Lab, São Paulo, Brazil, 2024.

*"Magnetic levitation of superfluid helium drops"* Quantum Engineering of Levitated Systems, Benasque, Spain, 2024.

*"Testing the linearity of quantum mechanics: high-amplitude motion of a massive object"* Eddlemann Quantum Institute Workshop, Chateau de Balleroy, France, 2024.

*“Testing the linearity of quantum mechanics: high-amplitude motion of a massive object”* Nobel symposium NS194: Quantum control of mechanical systems, Särö, Sweden, 2024.

*“A proposal for detecting the spin of an individual electron bubble”* The 15th International Conference on Quantum Fluid Clusters, Aarhus, Denmark, 2024.

*“Measuring the knots and braids of non-Hermitian oscillators”* Physics Colloquium, Yale University, New Haven, CT, 2024.

*“Phonon coherences in a superfluid optomechanical device”* Special Seminar, Joint Quantum Institute, College Park, MD, 2024.

*“Measuring the knots and braids of non-Hermitian oscillators”* JQI Seminar, Joint Quantum Institute, College Park, MD, 2024.

*“Testing the linearity of quantum mechanics with superfluid resonators”* Physics of Quantum Electronics (plenary talk), Snowbird, UT, 2024.

*“Measuring high-order phonon coherences in a superfluid optomechanical device”* Quantum Colloquium, ISTA, Klosterneuburg, Austria, 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Institute Colloquium, ISTA, Klosterneuburg, Austria, 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Princeton Quantum Colloquium, Princeton, NJ, 2023.

*“Measuring high-order phonon coherences in a superfluid optomechanical device”* IQIM Seminar, Caltech, Pasadena, CA 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Physics Department Colloquium, Caltech, Pasadena, CA, 2023.

*“What we do when we go around an exceptional point: Measuring the knots and braids of non-Hermitian oscillators”*, Workshop on Non-Hermitian Topology: from Classical Optics to Quantum Matter, Dresden, Germany, 2023.

*“Measuring the Berry phase in the dynamics of a Non-Hermitian system”* 20<sup>th</sup> International Workshop on Pseudo-Hermitian Hamiltonians in Quantum Physics, Istanbul, Turkey (online), 2023.

*“Counting Individual Phonons in Superfluid Helium: Precision Tests of Linearity in Massive Quantum Systems”* Gordon Research Conference on Quantum Sensing, Les Diablalets, Switzerland, 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Physics Department Colloquium, ETH, Zürich, Switzerland, 2023.

*“Counting phonons and measuring their coherences in a superfluid optomechanical device”*, Quantum Center Seminar, ETH, Zürich, Switzerland, 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Physics Department Colloquium, Northwestern University, Evanston, IL, 2023.

*“Measuring higher-order phonon correlations in a superfluid optomechanical device”*, Condensed Matter Seminar, Northwestern University, Evanston, IL, 2023.

*“Measuring higher-order phonon correlations in a superfluid optomechanical device”*, Princeton Quantum Sensing Seminar, Princeton, NJ (online), 2023.

*“Measuring the knots and braids of non-Hermitian oscillators”* Physics of Quantum Electronics (plenary talk), Snowbird, UT, 2023.

*“Measuring the knots and braids that are generic to coupled oscillators”* Distinguished Speaker Series, Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, 2022.

*“Measurements of superfluid helium drops levitated in high vacuum”* Twenty Ninth International Conference on Low Temperature Physics, Sapporo, Japan (online), 2022.

*“Non-Hermitian oscillators”* Summer School on the New Mechanics, École de Physique des Houches, Les Houches, France, 2022.

*“Nonreciprocal Phonon Transfer and the Braiding of Eigenvalues in Optomechanics”* Gordon Research Conference on Mechanical Systems in the Quantum Regime, Ventura, CA, 2022.

*“A Pedagogical Introduction to Non-Hermitian Systems: Braids and Knots for Beginners”* Invited Tutorial, CLEO, San Jose, CA (online), 2022.

*“The topology of tuning a non-Hermitian instrument: knots, braids, and exceptional points”* Physics Department Colloquium, University of Wisconsin, Madison, WI, 2022.

*“Magnetically levitated millimeter-scale superfluid drops”* The 14<sup>th</sup> International Conference on Quantum Fluid Clusters, Ettore Majorana Foundation and Center for Scientific Culture, Erice, Italy, 2022.

*“Measuring higher-order phonon statistics in a nanogram-scale superfluid optomechanical system”* Q-FARM Seminar, Stanford University, Palo Alto, CA, 2022.

*“Measuring the eigenvalue braids & knots near higher-order exceptional points”* Physics Department Colloquium, Stanford University, Palo Alto, CA, 2022.

*“Measuring higher-order phonon statistics in a nanogram-scale superfluid optomechanical system”* SRC Winter Workshop On Quantum Coherence in Condensed Matter, KAIST, South Korea (held online) 2022.

*“Measuring the eigenvalue topology near higher-order exceptional points: braids and knots as generic features in coupled oscillators”*, YQI Colloquium, Yale University, New Haven, CT, 2021.

*“Measuring the eigenvalue topology near higher-order exceptional points: braids and knots as generic features in coupled oscillators”*, Physics Department Colloquium, Washington University in St. Louis, MO (held online) 2021.

*“Measuring higher-order phonon correlations in a superfluid-filled optical cavity”*, Quantum Fluids and Solids, Bangalore, India (held online) 2021.

*“Measuring higher-order phonon correlations in a nanogram-scale superfluid optomechanical device”*, Challenges For Witnessing Quantum Aspects Of Gravity In A Lab, ICTP-SAFIR São Paolo, Brazil (held online) 2021.

*“Measuring higher-order phonon correlations in a nanogram-scale superfluid optomechanical device”*, VAMOS Seminar (held online) 2021.

*“Measuring higher-order phonon correlations in a nanogram-scale superfluid optomechanical device”*, MecaQ Seminar (inaugural talk) CNRS, France (held online) 2021.

*“Measuring higher-order phonon correlations in a nanogram-scale superfluid optomechanical device”*, NonGauss Workshop, Palacký University Olomouc, Czech Republic (held online) 2021.

*“Counting  $\mu\text{eV}$  phonons in a ng-scale superfluid helium cavity”* Second Workshop on Optomechanics for Dark Matter Detection, (held online) 2021.

*“Single-phonon quantum acoustics with superfluid helium”* Physics Department Colloquium, University of New Mexico (held online) 2020.

*“Single-phonon quantum acoustics with superfluid helium”* QISKIT Seminar, IBM T. J. Watson Center (held online) 2020.

*“Single-phonon quantum acoustics with superfluid helium”* Quantum Foundry Seminar, UCSB (held online) 2020.

*“Single-phonon quantum acoustics with superfluid helium”* Quantum Matter Seminar, Université Paris, Saclay, France (held online) 2020.

*“Single-phonon quantum acoustics with superfluid helium”* UniKORN Seminar, British Optomechanical Research Network (held online) 2020.

*“Single-phonon quantum acoustics with superfluid helium”* Nanomechanics Online Mini Workshop: “Frontiers of Nanomechanics” (held online) 2020.

*“Single-phonon quantum optomechanics experiments in a superfluid-filled cavity”* International Conference on Micromechanics, Obergurgl, Austria, 2020.

*"Single-phonon quantum optomechanics experiments in a superfluid-filled cavity"* Physics of Quantum Electronics, Snowbird, UT, 2020.

*"Quantum optomechanics experiments in superfluid helium"* Quantum Seminar, IBM T. J. Watson Research Center, Yorktown Heights, NY, 2019.

*"A pedagogical introduction to the emergence of topology in non-Hermitian dynamics"* Special Seminar, ENS, Paris, France 2019.

*"Quantum optomechanics experiments in superfluid helium"* Physics Department Colloquium, ENS, Paris, France, 2019.

*"Quantum optomechanics experiments in superfluid helium"* Micro and Nanophotonics Days, Paris, France, 2019.

*"Superfluid optomechanics"* Workshop on Quantum Optomechanical Architectures for Dark Matter Detection, Joint Quantum Institute, College Park, Maryland, 2019.

*"Quantum optomechanics experiments in superfluid helium"* 7<sup>th</sup> IQOQI Colloquium, Institute for Quantum Optics and Quantum Information, Innsbruck, Austria 2019.

*"A pedagogical introduction to the emergence of topology in non-Hermitian dynamics"* Theory Seminar, University of Innsbruck, Innsbruck, Austria 2019.

*"Optical, mechanical, and thermal properties of superfluid drops levitated in vacuum"* International Conference on Quantum Fluids and Solids, Edmonton, Canada, 2019.

*"Quantum optomechanics experiments in superfluid helium"* Rochester Conference on Coherence and Quantum Optics, Rochester, NY, 2019.

*"Quantum optomechanics with superfluid helium"* Physics Colloquium, University of Minnesota, Minneapolis, MN, 2019.

*"A pedagogical introduction to the emergence of topology in non-Hermitian dynamics"* Condensed Matter Seminar, University of Minnesota, Minneapolis, MN, 2019.

*"Quantum optomechanics with superfluid helium"* CuBit Quantum Seminar, Boulder, CO, 2019.

*"A pedagogical introduction to the emergence of topology in non-Hermitian dynamics"* CuBit Quantum Initiative, Boulder, CO, 2019.

*"Optical and mechanical properties of superfluid helium drops levitated in vacuum"* APS March Meeting, Boston, MA, 2019.

*"A pedagogical overview of the geometry and topology of complex matrices and the dynamics they generate"* Army Research Office Workshop on Non-Hermitian Physics and New Algebraic Structures, Chicago, IL, 2019.

*“Superfluid optomechanics”* Cryocourse 2018, Aalto University, Espoo, Finland, 2018.

*“Magnetic levitation and evaporative cooling of a mm-scale drop of superfluid helium”* Conference on Quantum Engineering of Levitated Systems, Benasque, Spain, 2018.

*“Topological physics with a pair of damped oscillators: beyond Berry's phase via exceptional points”* Physics Colloquium, City College of New York, NY, 2018.

*“Demonstration of topological adiabatic transport around exceptional points”* IEEE Summer Topical Meetings, Waikoloa, HI, 2018.

*“Quantum effects in the motion of surprisingly large objects”* Distinguished Lecturer Series, Max Planck Institute for the Science of Light, Erlangen, Germany, 2018.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Special seminar, Max Planck Institute for the Science of Light, Erlangen, Germany, 2018.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Physics Colloquium, Queens College, NY, 2018.

*“Quantum effects in the motion of surprisingly large objects”* Physics Department Colloquium, Yale University, CT, 2018.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Physics of Quantum Electronics (plenary talk), Snowbird, UT, 2018.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Physics Colloquium, Rice University, Houston, TX, 2017.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Condensed Matter Seminar, University of Texas, Austin, TX, 2017.

*“Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points”* Physics Colloquium, University of Rochester, Rochester, NY, 2017.

*“The Arnold-Jordan normal form and topological structure near exceptional points”* ICTP Advanced School on Foundations and Applications of Nanomechanics, Trieste, Italy, 2017.

*“The normal mode expansion for damped coupled oscillators”* ICTP Advanced School on Foundations and Applications of Nanomechanics, Trieste, Italy, 2017.

*“Quantum oscillators in the correspondence limit”* ICTP Advanced School on Foundations and Applications of Nanomechanics, Trieste, Italy, 2017.

*“Topological control in optomechanical cavities”* NIM Conference on Cavity QED, Munich, Germany, 2017.

*"Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points"* META International Conference on Metamaterials, Photonic Crystals and Plasmonics, Incheon, South Korea, 2017.

*"Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points"* Weekly Seminar, Laboratory for Physical Sciences, College Park, MD, 2017.

*"Quantum optomechanical effects in a superfluid-filled optical cavity"* APS March Meeting, New Orleans, LA, 2017.

*"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, University of Southern California, Los Angeles, CA, 2017.

*"Topological physics with a pair of oscillators: beyond Berry's phase via exceptional points"* Physics Department Colloquium, SUNY Stony 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, Hannover, 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"* SQulnT, 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, Zürich, Switzerland, 2008.

*"Dispersive optomechanics: A new approach to macroscopic quantum phenomena"* Physics Department Colloquium, ETH, Zürich, 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 talk), 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.