

Benjamin L. Lev, Ph.D.

Curriculum Vitae, September 2026

Personal *Address:* Ginzton Laboratory Box 305, Stanford, CA 94305
Tel/Fax: 650-723-0268
Internet: benlev@stanford.edu
Website: levlab.stanford.edu
Date and Place of Birth: September 9, 1977; Colorado Springs, Colorado

Academic positions

6/26 to present Stanford Fortitude Professor
 Professor of Physics and Applied Physics
 Deputy Director of QFARM
 Deputy Director of Ginzton Lab
 Stanford University

9/22 to 6/26 Professor of Physics and Applied Physics
 Deputy Director of QFARM
 Deputy Director of Ginzton Lab
 Stanford University

9/15 to 8/22 Associate Professor, Departments of Physics and Applied Physics
 Member of Ginzton Laboratory and QFARM; Bio-X affiliate
 Stanford University

9/11 to 8/15 Assistant Professor, Departments of Applied Physics and, by courtesy, Physics
 Member of Ginzton Laboratory
 Stanford University

1/08 to 8/11 Assistant Professor, Department of Physics, University of Illinois at Urbana-
 Champaign

1/06 to 11/07 NRC Research Associateship (postdoc) in group of Prof. Jun Ye, JILA/NIST

10/05 to 12/05 Postdoctoral Scholar, California Institute of Technology
 Cavity QED with atom chips and microresonators

Education

8/99 to 9/05 California Institute of Technology
 Ph.D. in Physics, September 2005
 Thesis Advisor Prof. Hideo Mabuchi
 Ph.D. Dissertation: *Magnetic Microtraps for Cavity QED, Bose-Einstein
 Condensates, and Atom Optics*

9/95 to 6/99 Princeton University
 A.B., Physics
 Magna Cum Laude, June 1999

Undergraduate Thesis Advisors Prof. Bernard Keimer and Prof. Paul Chaikin
 Senior Thesis: *Magnetotransport measurements in deuterated (TMTSF)₂ClO₄*

9/92 to 6/95 Crystal River High School, Crystal River, Florida
 Valedictorian, June 1995

Honors and awards

2026	Endowed professorship, title: Stanford Fortitude Professor
2021	Fellow of the American Physical Society
2021	Editorial Board, Physical Review X
2020	Member of the Defense Science Study Group (IDA & DARPA)
2015	Chambers Fellowship (Stanford)
2014	Terman Fellowship (Stanford)
2012	DARPA Young Faculty Award (YFA)
2012	Office of Naval Research Young Investigator Award (ONR YIP)
2011	Terman Fellowship (Stanford)
2010	Presidential Early Career Award for Scientists and Engineers (PECASE) from NSF
2010	David and Lucile Packard Fellowship
2010	Center for Advanced Study Beckman Fellowship
2008	National Science Foundation (NSF) CAREER Award
2008	Air Force Office of Scientific Research Young Investigator Award (AFOSR YIP)
2007	Best Poster in the Boulder Labs Postdoctoral Poster Symposium
2006	NRC Research Associateship (JILA/NIST postdoc)
2004	Everhart Distinguished Graduate Student Lectureship, Caltech
2003	Best Poster Presentation in the Division of Physics, Mathematics, and Astronomy at Division of Physics, Mathematics, and Astronomy at the Caltech Graduate Student Symposium
1999	Allen Goodrich Schenstone Prize for Outstanding Work in Experimental Physics, Department of Physics, Princeton University
1999	Sigma Xi Honor Society
1997	Awards from the Class of 1934 Special Assistance Fund, the Fred Fox Class of 1939 Fund, and the Horton-Elmer Classes of 1942 and 1992 Fund; Princeton University
1995	National Science Scholar
1994	Third Place Grand Award, Physics, International Science and Engineering Fair, Birmingham, Alabama; United Technologies Corp. Special Award in Physics
1994	Second Place Florida State Science and Engineering Fair, Physics

Extracurricular activities

2024 – present	Member of Advisory Council for the Department of Physics at Princeton University
2023 – present	Member of Stanford's QFARM Executive Committee
2021 – present	Editorial Board, Physical Review X
2020 – 2024	Member of the Defense Science Study Group (DSSG) managed by the Institute for Defense Analyses (IDA) and funded by DARPA

Commentary and reviews

- L. Chomaz, I. Ferrier-Barbut, F. Ferlaino, B. Laburthe-Tolra, B. L. Lev, and T. Pfau, *Dipolar physics: a review of experiments with magnetic quantum gases*, Reports on Progress in Physics **86**, 026401 (2023).

- E. Altman *et al.*, *Quantum Simulators: Architectures and Opportunities*, PRX Quantum **2**, 017003 (2021).
- L. D. Carr and B. L. Lev, *Viewpoint: An Arrested Implosion*, Physics **9**, 55 (2016).

Publications, under review or in preparation

- L. Skolc, S. Chattopadhyay, F. Marijanović, Q. Li, J. Keeling, B. L. Lev, and E. Demler, *Superradiant Charge Density Waves in a Driven Cavity-Matter Hybrid*, [arxiv:2603.28432](https://arxiv.org/abs/2603.28432)
- H. S. Hiller, P. Parakh, S. H. Aronson, K. Maeda, D. Lao, J. Stewart, Z. She, J. Wang, X. Xu, T. Heinz, B. L. Lev, *A cryogenic apparatus for coupling two-dimensional materials to a confocal multimode optical cavity*, [arXiv:2605.28815](https://arxiv.org/abs/2605.28815)

Publications, peer-reviewed

From Lev Lab:

- B. P. Marsh, D. Atri Schuller, Y. Ji, H. S. Hunt, S. Ganguli, S. Gopalakrishnan, J. Keeling, and B. L. Lev, *High-capacity associative memory in a quantum-optical spin glass*, [Science \(2026\)](https://doi.org/10.1126/science.1260403).
- Y. Zhang, K. Yang, B. L. Lev, and M. Rigol, *Effects of intertube dipole-dipole interactions in nearly integrable one-dimensional ¹⁶²Dy gases*, Physical Review A **113**, 023314 (2026).
- B. P. Marsh, D. Atri Schuller, Y. Ji, H. S. Hunt, G. Z. Socolof, D. P. Bowman, J. Keeling, and B. L. Lev, *A multimode cavity QED Ising spin glass*, Physical Review Letters **135**, 160403 (2025).
PRL Collection of the Year, 2025
Cover of Physical Review Letters
Selected as Editors' Suggestion
- R. Kroeze, B. Marsh, D. Atri Schuller, H. Hunt, A. Bourzutschky, M. Winer, S. Gopalakrishnan, J. Keeling, and B. Lev, *Directly observing replica symmetry breaking in a vector quantum-optical spin glass*, Science **389**, 1122 (2025).
Highlighted "In Science Journals."
- A. N. Bourzutschky, B. L. Lev, and J. Keeling, *Raman-phonon-polariton condensation in a transversely pumped cavity*, npj Quantum Materials **9**, 81 (2024). npj Quantum Materials special issue on "Light Induced States of Matter."
- K. Yang, Y. Zhang, K.-Y. Li, K. -Y. Lin, S. Gopalakrishnan, M. Rigol, and B. L. Lev, *Phantom energy in the nonlinear response of a quantum many-body scar state*, Science **385**, 1063 (2024).
- B. P. Marsh, R. M. Kroeze, S. Ganguli, S. Gopalakrishnan, J. Keeling, and B. L. Lev, *Entanglement and replica symmetry breaking in a driven-dissipative quantum spin glass*, Physical Review X **14**, 011026 (2024).
- K.-Y. Li, Y. Zhang, K. Yang, K.-Y. Lin, S. Gopalakrishnan, M. Rigol, and B. L. Lev, *Rapidity and momentum distributions of 1D dipolar quantum gases*, Physical Review A **107**, L061302 (2023).
Selected as a Letter and Editors' Suggestion

- R. M. Kroeze, B. P. Marsh, K.-Y. Lin, J. Keeling, and B. L. Lev, *High Cooperativity Using a Confocal-Cavity–QED Microscope*, PRX Quantum **4**, 020326 (2023).
- Y. Guo, R. M. Kroeze, B. P. Marsh, S. Gopalakrishnan, J. Keeling, and B. L. Lev, *An optical lattice with sound*, Nature **599**, 211 (2021).
News coverage:
 - [Stanford News](#): *Adding sound to quantum simulations*
 - [APS Physics Magazine](#): *A Humming Lattice of Cold Atoms*
- B. P. Marsh, Y. Guo, R. M. Kroeze, S. Gopalakrishnan, S. Ganguli, J. Keeling, and B. L. Lev, *Enhancing associative memory recall and storage capacity using confocal cavity QED*, Physical Review X **11**, 021048 (2021).
News coverage:
 - APS Synopsis in [Physics](#): *A Computer Memory Based on Cold Atoms and Light*
 - APS DAMOP Highlight: *Atoms and Light Remember Better*
- S. Taylor, F. Yang, B. Freudenstein, and B. L. Lev, *A scanning quantum cryogenic atom microscope at 6 K*, SciPost Physics **10**, 060 (2021).
- W. Kao, K.-Y. Li, K.-Y. Lin, S. Gopalakrishnan, and B. L. Lev, *Topological pumping of a 1D dipolar gas into strongly correlated prethermal states*, Science **371**, 296 (2021).
News coverage:
 - [Stanford News](#): *Stanford physicists find new state of matter in a one-dimensional quantum gas*
 - APS DAMOP Highlight: *The Turn of the Screw*
- C. Rylands, Y. Guo, B. L. Lev, J. Keeling, and V. Galitski, *Photon-mediated Peierls Transition of a 1D Gas in a Multimode Optical Cavity*, Physical Review Letters **125**, 010404 (2020).
News coverage:
 - Joint Quantum Institute [Research News](#): *Quantum Simulation Stars Light in the Role of Sound*
- F. Yang, S. Taylor, S. Edkins, J. Palmstrom, I. Fisher, and B. L. Lev, *Nematic Transitions in Iron-Pnictide Superconductors Imaged with a Quantum Gas*, Nature Physics **16**, 514 (2020).
News coverage:
 - Nature Physics **16**, 506 (2020): [News & Views](#): J. Analytis, *Cooking with quantum gas*
 - [Phys.org](#) article: “Imaging nematic transitions in iron pnictide superconductors”
 - [Physics World](#) article: “Ultracold atoms put high-temperature superconductors under the microscope”
- R. Kroeze, Y. Guo, and B. L. Lev, *Dynamical Spin-Orbit Coupling in a Quantum Gas*, Physical Review Letters **123**, 160404 (2019).
- Y. Guo, R. Kroeze, V. Vaidya, J. Keeling, and B. L. Lev, *Sign-changing photon-mediated atom interactions in multimode cavity QED*, Physical Review Letters **122**, 193601 (2019).
News coverage:
 - Chosen as Editors’ Suggestion
 - APS Physics [Synopsis](#): *A step toward simulating spin glasses*
- Y. Guo, V. Vaidya, R. Kroeze, R. A. Lunney, B. L. Lev, and J. Keeling, *Emergent and broken symmetries of atomic self-organization arising from Gouy phase shifts in multimode cavity QED*, Physical Review A **99**, 053818 (2019). Companion paper to the above. Erratum: Physical Review A **103**, 019901(E) (2021).

News coverage:

- Chosen as Editors' Suggestion
- APS Physics [Synopsis](#): *A step toward simulating spin glasses*

- R. Kroeze, Y. Guo, V. Vaidya, J. Keeling, and B. L. Lev, *Spinor self-ordering of a quantum gas in a cavity*, Physical Review Letters **121**, 163601 (2018).

- Y. Tang, W. Kao, K.-Y. Li, and B. L. Lev, *Tuning the dipole-dipole interaction in a quantum gas with a rotating magnetic field*, Physical Review Letters **120**, 230401 (2018).

- Y. Tang, W. Kao, K.-Y. Li, S. Seo, K. Mallayya, M. Rigol, S. Gopalakrishnan, and B. L. Lev, *Thermalization near integrability in a dipolar quantum Newton's cradle*, Physical Review X **8**, 021030 (2018).

News coverage:

- Science [Editor's Choice](#): *Watching magnetic atoms thermalize*, **360**, 749 (2018)
- ScienceNews [News: Quantum Physics](#) *A tiny version of this physics toy is revealing quantum secrets*
- APS Physics [Synopsis](#): *Pathway to Quantum Thermalization*
- Nature Physics [Research Highlight](#): *Towards thermalization*, **14**, 430 (2018)
- Stanford News [Article](#): *Toy inspires experiment on behavior of quantum systems*
- Oxbridge Applications [Article](#): *A Toy Made Tiny: Newton's Cradle and Quantum Mechanics*
- Photonics Media [Article](#): *Newton's Cradle Yields Insight into Quantum Thermalization*
- Science Alert [Article](#): *Physicists Built a Real Quantum Newton's Cradle to Study the Changes of Quantum Chaos*

- V. Vaidya, Y. Guo, R. Kroeze, K. Ballantine, A. Kollár, J. Keeling, and B. L. Lev, *Tunable-range, photon-mediated atomic interactions in multimode cavity QED*, Physical Review X **8**, 011002 (2018).

News coverage:

- APS Physics [Viewpoint](#): H. Türeci, *A Multimode Dial for Interatomic Interactions*, Physics **11**, 3, (2018).

- F. Yang, A. J. Kollár, S. F. Taylor, R. W. Turner, and B. L. Lev, *Scanning Quantum Cryogenic Atom Microscope*, Physical Review Applied **7**, 034026 (2017).

News coverage:

- Selected as Editors' Suggestion
- APS Physics [Viewpoint](#): J. Fórtagh and A. Günther, *Sensing Magnetic Fields with a Giant Quantum Wave*, Physics **10**, 30 (2017).
- PNAS Journal Club: [Super-sensitive new microscope uses ultracold atoms to image magnetic fields at high precision](#)
- AIP InsideScience: [BRIEF: Introducing a New Kind of Microscope](#)

- A. J. Kollár, A. T. Papageorge, V. D. Vaidya, Y. Guo, J. Keeling, and B. L. Lev, *Supermode-density-wave-polariton condensation*, Nature Communications **8**, 14386 (2017).

- W. Kao, Y. Tang, N. Burdick, and B. L. Lev, *Anisotropic dependence of tune-out wavelength near Dy 741-nm transition*, Optics Express **25**, 3411 (2017).

- K. E. Ballantine, B. L. Lev, and J. Keeling, *Meissner-like effect for synthetic gauge field in multimode cavity QED*, Physical Review Letters **118**, 045302 (2017).

- N. Burdick, A. G. Sykes, Y. Tang, and B. L. Lev, *Anisotropic collisions of dipolar Bose-Einstein condensates in the universal regime*, New Journal of Physics **18**, 113004 (2016).

News coverage:

- New Journal of Physics [Perspective](#): I. Ferrier-Barbut, *Smashing Magnets*, New Journal of Physics **18** 111004 (2016).
- Y. Tang, A. G. Sykes, N. Q. Burdick, J. M. DiSciaccia, D. S. Petrov, and B. L. Lev, *Anisotropic expansion of a thermal dipolar Bose gas*, Physical Review Letters **117**, 155301 (2016).
- N. Q. Burdick, Y. Tang, and B. L. Lev, *Long-lived spin-orbit-coupled dipolar Fermi gas*, Physical Review X **6**, 031022 (2016).
- A. Papageorge, A. Kollár, and B. L. Lev, *Coupling to Modes of a Near-Confocal Optical Resonator Using a Digital Light Modulator*, Optics Express **24**, 11447 (2016).
- Y. Tang, A. Sykes, N. Q. Burdick, J. Bohn, and B. L. Lev, *s-wave scattering lengths of the strongly dipolar bosons ^{162}Dy and ^{164}Dy* , Physical Review A **92**, 022703 (2015). Erratum, Phys Rev A **93**, 059905(E) (2016).
- N. Y. Yao, S. D. Bennett, C. R. Laumann, B. L. Lev, and A. V. Gorshkov, *Bilayer fractional quantum Hall states with dipoles*, Physical Review A **92**, 033609 (2015).
- A. J. Kollár, A. T. Papageorge, K. Baumann, M. A. Armen, and B. L. Lev, *An adjustable-length cavity and Bose-Einstein condensate apparatus for multimode cavity QED*, New Journal of Physics **17**, 043012 (2015).
- Y. Tang, N. Q. Burdick, K. Baumann, and B. L. Lev, *Bose-Einstein condensates of ^{162}Dy and ^{160}Dy* , New Journal of Physics **17**, 045006 (2015). Invited contribution to special issue, Focus on Frontiers of Cold Molecules Research.
- N. Q. Burdick, K. Baumann, Y. Tang, M. Lu, and B. L. Lev, *Fermionic suppression of dipolar relaxation*, Physical Review Letters **107**, 190401 (2015).
- K. Baumann, N. Q. Burdick, M. Lu, and B. L. Lev, *Observation of low-field Fano-Feshbach resonances in ultracold gases of dysprosium*, Physical Review A, Rapid Communications **89**, 020701 (2014).
- M. A. Naides, R. W. Turner, R. A. Lai, J. M. DiSciaccia, and B. L. Lev, *Trapping ultracold gases near cryogenic materials with rapid reconfigurability*, Applied Physics Letters **103**, 251112 (2013).
- X. Cui, B. Lian, T.-L. Ho, B. L. Lev, and H. Zhai, *Synthetic Gauge Field with Highly Magnetic Lanthanide Atoms*, Physical Review A, Rapid Communications **88**, 011601(R) (2013).
- M. Lu, N. Q. Burdick, and B. L. Lev, *Quantum Degenerate Dipolar Fermi Gas*, Physical Review Letters, **108**, 215301 (2012).
News coverage:
 - Selected as Editors' Suggestion
 - APS Physics Viewpoint: [Quantum Dipolar Gases in Boson or Fermion Flavor](#), Physics **5**, 58 (2012).
- B. Dellabetta, T. L. Hughes, M. J. Gilbert, and B. L. Lev, *Imaging topologically protected transport with quantum degenerate gases*, Physical Review B **85**, 205442 (2012).
- M. Hafezi, Z. Kim, S. L. Rolston, L. A. Orozco, B. L. Lev, and J. M. Taylor, *Atomic interface between microwave and optical photons*, Physical Review A, Rapid Communications **85**, 020302(R) (2012).

- S. Gopalakrishnan, B. L. Lev, and P. Goldbart, *Exploring models of associative memory via cavity quantum electrodynamics*, Philosophical Magazine **92**, 353 (2012).
- M. Lu, N. Q. Burdick, S.-H. Youn, and B. L. Lev, *A Strongly Dipolar Bose-Einstein Condensate of Dysprosium*, Physical Review Letters **107**, 190401 (2011).
- S. Gopalakrishnan, B. L. Lev, and P. Goldbart, *Frustration and glassiness in spin models with cavity-mediated interactions*, Physical Review Letters **107**, 277201 (2011).
- V. A. Dzuba, V. V. Flambaum, and B. L. Lev, *Dynamic polarizabilities and magic wavelengths for dysprosium*, Physical Review A **83** 032502 (2011).
- M. Lu, S.-H. Youn, and B. L. Lev, *Spectroscopy of a narrow-line laser cooling transition in atomic dysprosium*, Physical Review A **83**, 012510 (2011).
- S.-H. Youn, M. Lu, and B. L. Lev, *Anisotropic sub-Doppler laser cooling in dysprosium magneto-optical traps*, Physical Review A **82**, 043403 (2010).
- S.-H. Youn, M. Lu, U. Ray, and B. L. Lev, *Dysprosium magneto-optical traps*, Physical Review A **82**, 043425 (2010).
- S. Gopalakrishnan, B. L. Lev, and P. Goldbart, *Atom-light crystallization of BECs in multimode cavities: Nonequilibrium classical and quantum phase transitions, emergent lattices, supersolidity, and frustration*, Physical Review A **82**, 043612 (2010).
 - News coverage:**
 - APS Physics Viewpoint: [Liquid-crystalline phases of ultracold atoms](#), Physics **3**, 88 (2010).
- M. Lu, S.-H. Youn, B. L. Lev, *Trapping ultracold dysprosium: A highly magnetic gas for dipolar physics*, Physical Review Letters **104**, 063001 (2010).
 - News coverage:**
 - Nature Research Highlights: [Dazzling dysprosium](#), Nature **463**, 1002 (2010).
 - PhysicsWorld: [Ultracold magnetic atoms bode well for quantum studies](#), February 18th, 2010.
- S. Gopalakrishnan, B. L. Lev, and P. Goldbart, *Emergent crystallinity and frustration with Bose-Einstein condensates in multimode cavities*, Nature Physics **5**, 845-850 (2009).
 - News coverage:**
 - Nature Physics News and Views: [Quantum optics: Crystals of atoms and light](#) Nature Physics **5**, 781 (2009).
- B. Fregoso, K. Sun, E. Fradkin, and B. L. Lev, *Biaxial nematic phases in ultracold dipolar Fermi gases*, New Journal of Physics **11**, 103003 (2009).

Publications prior to LevLab:

- R. Gehr, J. Volz, G. Dubois, T. Steinmetz, Y. Colombe, B. L. Lev, R. Long, J. Estève, J. Reichel, *Cavity-based single atom preparation and high-fidelity hyperfine state readout*, Physical Review Letters **104**, 203602 (2010).
- H. J. Kimble, B. L. Lev, and J. Ye, *Optical interferometers with reduced sensitivity to thermal noise*, Physical Review Letters **101**, 260602 (2008).

- M. Lara, B. L. Lev, and J. Bohn, *Loss of molecules in magneto-electrostatic traps due to nonadiabatic transitions*, Physical Review A **78**, 033433 (2008).
- B. L. Lev, A. Vukics, E. Hudson, B. Sawyer, P. Domokos, H. Ritsch, and J. Ye, *Prospects for the cavity-assisted laser cooling of molecules*, Physical Review A **77**, 023402 (2008).
- B. Sawyer, B. Stuhl, B. L. Lev, J. Ye, and E. Hudson, *Mitigation of loss within a molecular Stark decelerator*, European Journal of Physics D **48**, 197 (2008).
- B. Sawyer, B. L. Lev, E. Hudson, B. Stuhl, M. Lara, J. Bohn, and J. Ye, *Magneto-electrostatic trapping of ground state OH molecules*, Physical Review Letters **98**, 253002 (2007).
News coverage:
 - [Cover](#) of Physical Review Letters, June 22nd, 2007.
 - Science's Editor's Choice [OH Trapped by Magnets](#), July 13th, 2007.
- B. L. Lev, E. Meyer, E. Hudson, B. Sawyer, J. Bohn, and J. Ye, *OH hyperfine ground state: from precision measurement to molecular qubits*, Physical Review A, Rapid Communications **74**, 061402(R) (2006).
- P. E. Barclay, K. Srinivasan, O. Painter, B. Lev, and H. Mabuchi, *Integration of Fiber Coupled High-Q Silicon Nitride Microdisks with Magnetostatic Atom Chips*, Applied Physics Letters **89**, 131108 (2006).
News coverage:
 - [Cover](#) of Applied Physics Letters, September 25th, 2006.
- P. Treutlein, T. Steinmetz, Y. Colombe, B. Lev, P. Hommelhoff, J. Reichel, M. Greiner, O. Mandel, A. Widera, T. Rom, I. Bloch, and T. W. Hänsch, *Quantum Information Processing in Optical Lattices and Magnetic Microtraps*, Fortschritte der Physik **54**, 702 (2006). Also in: Elements of Quantum Information, ed. by W.P. Schleich and H. Walther (Wiley-VCH, Weinheim, Germany, 2007), pp. 121-144.
- B. Lev, K. Srinivasan, P. Barclay, O. Painter, and H. Mabuchi, *Feasibility of Detecting Single Atoms using Photonic Bandgap Cavities*, Nanotechnology **15**, S556 (2004).
- A. Hopkins, B. Lev, and H. Mabuchi, *Proposed Magneto-Electrostatic Ring Trap for Neutral Atoms*, Physical Review A **70**, 053616 (2004).
- B. Lev, *Fabrication of Micro-Magnetic Traps for Cold Neutral Atoms*, Quantum Information and Computation, Vol. **3**, No. 5, 450-464, (2003).
- B. Lev, Y. Lassailly, C. Lee, A. Scherer, and H. Mabuchi, *Atom Mirror Etched from a Hard Drive*, Applied Physics Letters, **83**, 395-397, (2003).
- H. Mabuchi, M. Armen, B. Lev, M. Loncar, J. Vuckovic, H.J. Kimble, J. Preskill, M.L. Roukes, and A. Scherer, *Quantum Networks Based on Cavity QED*, Quantum Information and Computation **1**, Special Issue, 7-12, (2001).
- B. Wixted, B. Lev, and P. Denes, *Radiation Hardness Evaluation of the Analog Devices AD9042 ADC for Use in the CMS Electromagnetic Calorimeter*, Nuclear Instruments and Methods in Physics Research Section A, **417**, 371-376, (1998).

Non-peer-reviewed publications

- S. Koltsev, B. Lev, J. Fortagh, V. Baraulia, *Powerful narrow-line source of blue light for laser cooling Yb/Er and Dysprosium atoms*, Proc. of SPIE **7578**, 75782F-1 (2010).
- J. Ye, S. Blatt, M. M. Boyd, S. M. Foreman, E. R. Hudson, T. Ido, B. Lev, A. D. Ludlow, B. C. Sawyer, B. Stuhl and T. Zelevinsky, *Precision measurement based on ultracold atoms and cold molecules*, in Atomic Physics 20, XX International Conference on Atomic Physics (C. Roos et al., Eds., AIP Conf. Proc. 869, 2006), pp. 80-91. Also in: International J. Mod Phys. D (IJMPD) 16, 2481 - 2494 (2007).

Departmental teaching

Stanford

- Physics 13N: A Taste of Quantum Physics; Frosh IntroSeminar; Fall 2022, Fall 2023, Fall 2024.
- Physics 182/282 & Applied Physics 282: Quantum gases; Winter 2020, Winter 2022, Winter 2023, Winter 2024, Winter 202, Winter 2025.
- Applied Physics 376: Literature of Quantum Simulation; Spring 2022
- Applied Physics 203: Atoms, Fields and Photons; Spring 2014; Spring 2015; Fall 2015; Fall 2016; Fall 2017; Fall 2018; Fall 2019; Fall 2020
- Physics 182/282 & Applied Physics 282: Introduction to Modern Atomic Physics and Quantum Optics; Winter 2017; Winter 2018; Winter 2019
- Applied Physics 376: Literature of Ultracold Atomic Physics; Spring 2013; Winter 2016
- Applied Physics 305: Advanced Nonlinear Optics Laboratory, Winter 2013; Fall 2013, Fall 2014.
- Applied Physics 387: Quantum Optics and Measurement, Fall 2012.

UIUC

- UIUC Physics 401: Classical Physics Laboratory. Fall 2009, Spring 2010, Fall 2010, Spring 2011
- UIUC Physics 214/213: Quantum and Thermal Physics. Spring 2008

Outreach and external teaching

- Guest lecture, Verification of 21st Century Arms Control Treaties," Stanford INTLPOL 247, 4/26; *The 2nd Quantum Revolution and Quantum Sensing*
- Lab tour to students in a local high school's "Quantum Club," 2/26.
- High school presentation and Q&A on quantum physics, local school, 1/26; *Quantum-optical neural networks*
- Briefing on quantum science and engineering to Stanford Long-Term Investing (SLTI) institute's hosting of GiTOS and AustralianSuper for a 2-day workshop, Stanford, 9/25.
- High school presentation and Q&A on quantum physics, local school, 1/25; *A Taste of Quantum Physics*
- Participant in Business Executives for National Security (BENS) roundtable for Silicon Valley executives, Palo Alto, CA, 9/24.
- Briefing on quantum science and engineering to Stanford Long-Term Investing (SLTI) institute's hosting of AustralianSuper for a 2-day workshop, Stanford, 9/24.
- Panel speaker on Stanford Transfer Visit Day, "Connecting with Faculty" Panel, Stanford Visitor Center, 8/24.
- Local Stanford stakeholder (faculty representative, organizer, and lecturer) for the Warrior-Scholar Project; AY22-AY23; key lead on week-long bootcamp 7/24. Secured \$30k from the Stanford School of Humanities & Sciences to support program.

- Briefing on quantum science and engineering as it relates to national security to Joint Chiefs of Staff General Hokanson, 4-star Chief of the National Guard Bureau, Pentagon, 7/24.
- Invited by the CEO of Noblis to give a seminar talk to their executive board and quantum team on quantum science and engineering as it relates to national security and the future business horizon; Gave talk at the Noblis headquarters in VA, 7/24.
- Invited by the President and CEO of BENS (Business Executives for National Security), General Tim Ray, to present a 90-min discussion to their members about quantum science and engineering as it relates to national security and the future business horizon; Gave talk at the BENS headquarters in Washington, DC, 5/24.
- Lab tour to participants of the Conference for Undergraduate Women in Physics (CUWiP), 1/24.
- High school presentation and Q&A on quantum physics, local school, 1/24; *A Taste of Quantum Physics*
- Invited speaker/panelist at the Yale Career Café, 7/23.
- Lab tour to students in AP Physics and “Quantum Club” from local high school, 3/23.
- Invited seminar talk to a graduate and undergraduate student-organized organization, the MIT iQuISE (Quantum Information Science and Engineering) seminar, MIT, 5/23; *Playing with quantum toys: Atomic Newton’s cradles and Archimedes’ screws*
- Talk and discussion with the Physics Club students at Phillips Exeter Academy, 3/23;
- Keynote address, United States International Young Physicists’ Tournament, USIYPT 2023, Nueva Upper School, San Mateo, CA, 2/23; *Playing with a Quantum Toy*
- Invited talk to the Carnegie Endowment for International Peace think tank, 1/23; *Perspectives on quantum computation*
- Invited talk to Warrior-Scholar Project for the 2022 Virtual 1-Week HUM session, 12/22; *Quantum physics research in Lev Lab*
- Lab tour to students in AP Physics from local high school, 11/22.
- “Meet the Professor” seminar with 1st year students from Applied Physics, 10/22
- STEM fair TED-style talk on quantum physics, local school, 3/22; *A Taste of Quantum Physics*
- High school presentation and Q & A on quantum physics, local school, 1/22; *A Taste of Quantum Physics*
- Middle school presentation, lab activity, and Q & A on quantum physics, 3 hours; local school, 1/22; *A Taste of Quantum Physics*
- Invited lecture, Wonderfest: The Bay Area Beacon of Science, 7/21; *Playing with a Quantum Toy*
- Quantum Pathways Night, sponsored by the Stanford Quantum Computing Association, 2/21
- Guest lecture to local high school physics class, 1/21; *Playing with a quantum toy*
- Invited talk, Stanford Alumni Weekend, 10/18; *Playing with a Quantum Toy*
- Invited summer school lecture and seminar, Thermodynamics and non-equilibrium phenomena at quantum interfaces of light and matter, University of Cambridge, UK, 9/16; *From single-atom to many-body cavity QED*
- Lecture, The Hollyhock Fellow Summer Institute; workshop at Stanford for secondary school teachers who work in high-needs and high-poverty school districts, 7/15; *Quantum matter in the lab: creating the coldest gases in the known universe*
- Invited lecturer, APS March Meeting 2015, San Antonio, Tutorial #5: Quantum Gasses for Simulation; *Many-body physics using cavity QED*
- Applied Physics/Physics/SLAC Summer Research College Seminar and Lab Tour, 7/13; *Quantum simulation of next-generation materials with ultracold atomic gases*
- Seminar to Stanford Center for International Security and Cooperation (CISAC), 4/13
- Guest panelist, Future Faculty Seminar course, Stanford; From the Start: Your Guide to Setting Up and Running a Lab, 10/12

- Invited lecturer, Summer School on Quantum Matter: Foundations and New Trends, University of Granada, Spain, 9/11; *Exploring soft quantum matter in an AMO setting*
- Senior personnel in the EnLiST NSF center: Designed and conducted an atomic clock lab for an entrepreneurial STEM leadership program focusing on high school physics teachers. Spring 2009, Summer 2009, Summer 2010, Summer 2011
- 2010 Science Olympiad National Tournament tours, 5/10
- Lab tours to the Morrill Engineering Program, 2/10
- Saturday Physics Honors Program public lecture, *The Atom Chip*, University of Illinois at Urbana-Champaign, 11/09
- 2nd Annual Midwest Conference for Undergraduate Women in Physics tour; 1/09
- Caltech Alumni Seminar Day, Pasadena, California 5/05; *The Atom Chip*
- Everhart Distinguished Lecture, Caltech, Pasadena, California, 5/05; *The Atom Chip*

Service

Search committees

- Member of hiring committee for Monika Aidelsburger, Physics Department, AY 25-26
- Presented courtesy appointment case to the Physics Department for Xiaodong Xu, AY 24-25.
- Member of target of opportunity search committee, Condensed Matter Experiment, Department of Applied Physics; AY 24-25
- Chair of Open Area Faculty Search Committee, Department of Applied Physics; AY22
- Co-chair of target-of-opportunity hiring committee in quantum science, Physics Department, AY19-21
- Member of target-of-opportunity hiring committee in quantum science, Applied Physics Department, AY19-21
- Member, ad hoc committee on junior and target-of-opportunity searches, Physics and Applied Physics Departments AY19
- Junior faculty AMO search committee member, Department of Physics; AY12
- Junior faculty “Ginzton” search committee member, Department of Applied Physics; AY12

Departmental

- Member of Graduate Admissions Committee, Department of Physics; AY 25-26, AY 24-25
- Deputy Chair of Admissions, Recruiting, and Orientation, Department of Applied Physics; AY 25-26
- Major advisor, Department of Physics; AY25-26, AY23-24, AY22-23
- Member of Recruiting and Outreach Committee, Department of Physics; AY 24-25
- Orientation presenter on research in Departments of Physics and Applied Physics; AY23, AY24
- Panelist in Applied Physics orientation discussion, AY24
- Urbanek/Chodorow Named Fellowships Committee, Department of Applied Physics; AY 13, AY14, AY15 (chair), AY16 (chair), AY21, AY 24-25
- Chair of Orientation Committee, Department of Applied Physics; AY23
- Search committee for DFO position, Department of Applied Physics, Summer 2022
- Long-range planning committee, Department of Applied Physics, AY23
- Applied Physics Department website redesign committee; member AY23; member AY22; member AY21; (chair), AY17-20
- 1st year grad advisor, Department of Physics; member AY23, member AY22, member AY21, chair AY19
- Combined Graduate Study & Curriculum Committee, Applied Physics; member AY22
- Research Professor Re-Appointment Committee, Physics Department; AY21

- External review committee (research focus), Stanford Physics Department AY20
- External review committee, Stanford Applied Physics Department AY20
- Applied Physics colloquium committee (joint with Physics), Spring colloquium Chair AY 21; AY16-19
- Applied Physics first-year undergraduate course proposal committee, AY16
- Admissions, Recruiting, and Orientation Committee and Diversity Subcommittee, Department of Physics; AY16, AY17, (file reader AY23)
- Admissions, Recruiting, and Orientation Committee, Department of Applied Physics, Member; AY13, AY14, AY15, AY16, AY21, AY23
- Ad Hoc 'Omnibus' committee chair, Department of Applied Physics, AY15
- Founder and first organizer of the AMO physics seminar sub-series, AY15
- Optics & Electronic AP 483 Seminar series host, Spring Quarter AY14, Fall Quarter AY18
- Siemann Accelerator Physics Graduate Fellowship Committee, Department of Physics, AY13

Dean, university-wide, and external committees

- Princeton University, member of the Advisory Council review the Department of Physics, 2026.
- IntroSems Faculty Advisory Board, AY26, AY25
- Deputy Director of Ginzton Laboratory, Stanford University, 1/26-
- Interim Deputy Director of QFARM, Stanford University, 2/26-
- One of two academics attending the US Army Focused Excursion 25-4 meeting on Quantum in 2050, Aberdeen Proving Grounds, MD, 8/25.
- Participant at the LLNL Center for Global Security Research workshop on Nuclear Order and Global Disorder, Livermore, CA, 7/25.
- Member of faculty advisory board for the Stanford Introductory Seminar program, AY24-
- Member of the Advisory Council for the Princeton Physics Department, site visit review 4/25
- File reader for Stanford Science Fellowship, AY24-25.
- Panel speaker on Stanford Transfer Visit Day, "Connecting with Faculty" Panel, Stanford Visitor Center, 8/24.
- Stanford University Committee on Environmental Health and Safety (CEHS) for the academic years AY24-26
- Executive Committee of QFARM, AY22-
- Chair of Award Nomination Committee, Q-FARM AY23
- Co-chair of QFARM seminar series AY23
- Presentation to QFARM committee on quantum curriculum at Stanford AY20
- Participant in SLAC DOE RFI discussions on National Quantum Initiative (NQI) center, 2019
- Committee on 'Postdocs in H&S at Stanford,' AY17
- Curriculum review committee, AY15
- Evaluation committee for H&S fellowship programs, AY15

Student exams, advising, and guest lectures

- Applied Physics 3rd year review: (3) AY23.
- Physics and Applied Physics Ph.D. candidacy review committees: (Ethan Rosenfeld AP, Harrison P. AP, Abby Hartley Ph, Dominic Petruzzi Ph) AY26, (4) AY25, (2) AY24, (6) AY23, (5) AY22, (2) AY21, (3) AY20, (5) AY19, (3) AY18, (2) AY17, (2) AY16, (4) AY15, (5) AY14, (5) AY13, (4) AY12
- Physics and Applied Physics Ph.D. thesis defense committees: (4) AY25, (2) AY24, (2) AY23, (2) AY22, (1) AY21, (4) AY20, (1) AY19, (2) AY18, (3) AY17, (3) AY16, (3) AY15, (4) AY14, (4) AY13, (3) AY12

- Physics and Applied Physics 4th year review committee: (Michael Warhman AP, Heesoo Kim Ph) AY26, (1) AY25, (2) AY23, (1) AY21, (2) AY20, (5) AY19
- Co-Advisor for Vasily Kuzhulin, Prof. Mark Schnitzer's group, NeuroTech training program, part of the Center for Mind, Brain, Computation and Technology, AY20-22
- Pre-Major Advisor to freshman and sophomores, 2015-2017
- Physics 290: Physics Research Opportunities at Stanford, guest lecture, Fall 2011, 2012, 2013, 2014, 2015, 2018, 2019, 2021
- Physics 59: Current Research Topics, guest lecture, Fall 2011, 2015, 2018, 2019, 2021
- Quantum QFARM club lunch with students, Fall 2021

Conference and workshop organization and participation

- Co-organizer of the "Crazy Cavities" QFARM workshop at Stanford, 10/25.
- Panelist for the "Fundamental Quantum Science" session of the QFARM-hosted "State of Quantum" event at Stanford, 10/24.
- Co-organizer for Moore Foundation "Workshop on Solid-Light Hybrid States of Matter" at Stanford, 10/24.
- Co-organizer for ITAMP workshop on "Unravelling quantum many-body physics with long-range interacting platforms" at Harvard, 2023
- Co-organizer for Aspen Winter Conference on "Many-Body Cavity QED," Aspen, CO, AY19-AY20; postponed till 12/21 due to pandemic
- Panelist, Conference on "Analog Computational Methods," Virtual meeting run by U. Pitt., 8/20; Panel discussion on "What can analog systems really do, computationally?"
- Participant in NSF Workshop on Architectures and Opportunities in Programmable Quantum Simulators, 9/19
- Program organizing committee for Quantum Africa 5, Stellenbosch, South Africa AY19
- Lead organizer of Stanford SU2P and SPRC international workshop on Dynamics and Dissipation in Quantum Simulation, Stanford, CA, 7/18
- Co-organizer of ITAMP workshop on Many-Body Cavity QED at Harvard, 2017
- CLEO meeting chair, Atomic Ensemble and Bulk Crystal Quantum Memories, 2017
- APS March Meeting chair, Atoms and Molecules in Cavities, 2017
- DAMOP session chair, Novel Phases and Ordering in Fermi Gases, 2016
- DAMOP and APS March Meeting program committee member, 2015-2018
- Lead organizer of a Moore-Sponsored Workshop on Emergent Quantum Materials at the AMO/CM Interface, Carmel Valley Ranch, CA 1/14
- Organized Stanford workshop on neural networks in quantum optical systems; AY12
- ICAP 2014 Program Committee (International Conference on Atomic Physics)
- SQInT Program Committee (Southwest Quantum Information and Technology conference); 2013, 2014, 2015
- Quantum optics session organizer for Stanford Photonics Research Center Symposium 9/11
- Focus Session chair: Dipolar quantum gases; DAMOP 2011, Atlanta

External referee

- Reviewer for Science, Nature, Physical Review X, Physical Review Letters, Nature Physics, PRX Quantum, Nature Photonics, Physical Review A, New Journal of Physics, Scientific Reports, Physical Review B, Chemical Reviews, Journal of Modern Optics, J. Phys. B: At. Mol. Opt. Phys., Optics Express, Optics Letters, and Quantum Information Processing

- Proposal and faculty/fellowship reviewer for NSF, ARO, AFOSR, ONR, Deutsche Forschungsgemeinschaft, Austrian Academy of Sciences, US-Israel Binational Science Foundation, Villum Foundation

UIUC

- Search committee for advanced laboratory instructor AY11
- Presentation to Department of Physics outside Physics Advisory Board on research activities in condensed matter physics and AMO, 11/10
- Undergraduate studies committee AY11
- Chair, Quantum Information and AMO physics seminar AY11
- Graduate admissions committee AY09-11
- Physics undergraduate student academic mentor AY09-11
- Prelim committee (12, 1 chair); Ph.D. thesis defense committee (4, 1 chair) AY09-11
- Machine shop machinist search committee AY09
- UIUC Physics 499: Physics Frontiers; guest lecture. Fall 2008, Fall 2009, Fall 2010
- UIUC Physics 598MAP: Modern Atomic Physics; guest lecture. Spring 2008

Caltech

- Graduate student orientation committee, Caltech, (2000 - 2003)

Ph.D. students supervised

Kenji Meada (2025–), Zhiwei “Henry” He (2025–), Rin Kuroda (2025–), Tony He (2025–), Giulia Socolof (2025–), Deven Bowman (2025–), Pranav Parakh (2025–), Derek Baldwin (2023–), Han Hiller (2022–), David Atri Schuller (2022–), Kangning Yang (2021–), Alexander Bourzutschky (2021–2025), Kuan-Yu Lin (2017–2025), Brendan Marsh (2018–2024), Ronen Kroeze (2017–2023), Kuan-Yu Li (2016–2022), Yudan Guo (2016–2021), Stephen Taylor (2016–2021), Wil Kao (2015–2021), Fan Yang (2015–2021), Yijun Tang (2013–2018), Alexander Papageorge (2011–2016), Alicia Kollár (2010–2016), Nathaniel Burdick (2010–2016), Richard Turner (2009–2015), Matthew Naides (2009–2014), Mingwu Lu (2008–2014), Seo Ho Youn (2007–2011)

Postdocs supervised

Sam Aronson, Urbanek Fellow (2025–); Yunpeng Ji (2024–2025); Zengdong Zhang, Bloch Fellow (2022–2025); Di “Rody” Lao (2022–2025); Steven Edkins, Urbanek Fellow (2017–2019); Sang Won Seo (2017); Varun Vaidya (2016–2018); Alicia Kollár (2016–2017); Jack DiSciaccia, Urbanek Fellow (2013–2015); Kristian Baumann (2012–2014)

Master’s students mentored

Alex Boulton McKeehan (2022–2023), Brandon Freudenstein (2018–2021), Chen Wu (2018–2020)

Visiting scholars supervised

Brian Kasch (2009–2010, UIUC)

Undergraduate research assistants supervised

Ezra Steinberg (2026–), Yosheb Getachew (2021-2022, senior thesis), Iñigo Valenzuela Lombera (2020-2021, senior thesis), Haowei Li (2019), Nazli Koyluoglu (2018-2019), Jeffrey Brown (2018-2019), Jenny Hu (2018), Anna Widder (2017), Naijun Jin (2017), Anjun Jin (2017), Sammy Goldman (2016–2017), Siyun

Zhou (2015–2016), James Allen (2016), Tudor Ciobanu (2015–2016), John Stayner (2015–2016), Brett Harvey (2014–2015), Cristian Zanoci (2014–2015), Melis Tekant (2013), Dai Shen (2013), Hunter Swan (2013), Alex Martinez (2012), Zach Ellison (2012), Alfred Zong (2011–2012), Yi-Shu Wei (2011), Vernon Redmon (2009–2011, UIUC), Yu-Ming Liu (2010–2011, UIUC), Atanas Stankov (2009–2010, UIUC), Daniel Rajchwald (2009, UIUC), Yehan Liu (2008, UIUC), Vijay Ramesh (2007–2008, UIUC)

High school students supervised

Clara Burke (2026), Sophia Chen (2024), Ethan Leeman (2024), Sam Engel (2023), Will Walecka (2013), Sophie Kivelson (2013, 2012)

External funding

2009 AFOSR Young Investigator Program (YIP); *Exploring quantum liquid crystals using ultracold dipolar atoms*; single PI; 3 yrs
 2009 NSF CAREER (became PECASE in 2011); *CAREER: Exploring exotic matter through the quantum manipulation of dipolar atoms*; single PI; 5 yrs
 2009 DOE BES ESPM; *Atom chip microscopy: A novel probe for strongly correlated materials*; single PI; 3.5 yrs
 2009 ARO MURI; *Photonic Networks for Atomic and Solid State Quantum Memories and Processors*; one of 10 PIs; 5 yrs
 2010 Packard Fellowship; *Exploring Exotic Soft Quantum Matter using emergent Atom Light Crystals* single PI; 7 yrs
 2012 DARPA Young Faculty Award (YFA); *Quantum Brazovskii physics via fully emergent and compliant optical lattices*; single PI; 2 yrs
 2012 ONR Young Investigator Program (YIP); *Quantum glasses via multimode, many-body cavity QED*; single PI; 3 yrs
 2012 AFOSR AMP; *Quantum liquid crystals of ultracold dysprosium*; single PI; 5 yrs
 2012 Moore Foundation; *Using Ultracold Atoms to Investigate Cooperative Phenomena in Materials*; single PI; 5 yrs
 2014 NSF AMO-E; *Synthetic gauge fields in quantum gases of dysprosium*; single PI; 3 yrs
 2014 DOE BES ESPM; *Scanning quantum gas atom chip microscopy of strongly correlated and topologically nontrivial materials*; single PI; 3 yrs
 2015 ARO STIR; *Characterizing a multimode cavity QED system*; single PI; 9 mo
 2015 ARO AMP; *Computing with neuromorphic dissipative quantum phase transitions*; single PI; 3 yrs
 2016 NSF-SRC E2CDA; *E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics*; one of 8 PIs; 3 yrs
 2017 NSF AMO-E; *One-Dimensional Gases of Dysprosium*; single PI; 3 yrs
 2017 ONR AMQ; *Enhancing the resolution, sensitivity, and bandwidth of a quantum sensor for imaging technologically relevant materials*; single PI; 3 yrs
 2017 AFOSR AMP; *Engineering light-mediated interactions in dysprosium for quantum many-body physics*; single PI; 5 yrs
 2018 DOE BES QIS; *Frontiers in Quantum Metrology and Transduction*; one of 6 PIs; 3 yrs
 2019 ARO AMP & QIS; *Quantum neuromorphic computing and simulation with multimode cavity QED*; single PI; 3 yrs
 2019 DURIP AFOSR; *Equipment for a dysprosium multimode cavity QED science chamber and pump laser*; single PI; 1 yr
 2019 ARO STIR; *Imaging nonlocal electronic transport with the SQCRAMscope*; single PI; 9 mo
 2019 NTT; *Fundamental principles and next steps for Coherent Ising Machines*; one of many PIs; 5 yrs
 2020 NSF AMO-E; *Exploring excited-state 1D dipolar quantum matter with dysprosium gases*; single PI; 3 yrs
 2020 DOE; *Q-NEXT – Next Generation Quantum Science and Engineering*; one of many PIs; 5 yrs
 2021 DOE BES QIS; *Frontiers in Quantum Metrology and Transduction (extension)*; lead PI; one of 6 PIs; 1 yr

2021 ONR AMQ; *Sensing quantum vacuum fluctuations from correlated materials*; single PI; 3 yrs
 2021 ARO STIR; *Toward the exploration of the quantum vacuum optics of metamaterials with the SQCRAMscope*; single PI; 9 mo
 2021 Moore Foundation; *A novel apparatus for strongly coupling materials to light*; lead PI, one of 3 PIs, 4 yrs
 2022 ARO AMP & QIS; *Associative memory using glassy confocal cavity QED*; single PI, 3 yrs
 2022 AFOSR; *Dynamical optical lattices of dysprosium*; single PI, 5 yrs
 2023 NSF AMO-E; *Exploring the properties of quantum many-body scar states in dipolar gases*; 4 yrs
 2024 QFARM Seed Grant; \$200k; 2 yrs; lead-PI
 2024 ARO DURIP: *DURIP: Creating a Spin-1/2 Quantum Spin Glass through Rydberg-Dressed Multimode Cavity QED*; \$297,150; 1 year; single PI
 2025 AFOSR; *Novel dynamical spin glass networks in cavity QED systems*; \$480k, co-PI, 4 yrs
 2025 ONR; *Engineering a critical phase through feedback*; \$600k, single PI, 3 yrs
 2025 ARO; *Synaptic plasticity and dynamics of quantum-optical associative memories*; \$1M, single PI, 4 years

Pending

2025 ARO; *Developing a theoretical foundation for quantum-optical associative memories*; \$680k, single PI, 4 years
 2025 ARO; *Quantum Simulation of Vibrating Materials*, 600k, single PI, 3 years
 2026 DOE; *Transduction of optical photons to phonons with application to quantum-optical associative memory*, \$1.5M, Lead PI, \$750k to Lev, 3 years

Rejected

2026

Research talks

- Seminar talk, QFARM Seminar, Stanford University, 5/26; *Experimental Quantum-Optical Spin Glasses: Dynamics and Associative Memory*
- Invited talk, Cal-Bay Quantum School, Stanford University, 3/26; *An Experimental Quantum Optical Spin Glass: From Ultrametricity to Associative Memory*
- Seminar, Center for Theory of Quantum Matter (CTQM), University of Colorado, Boulder, 3/26; *Topological pumping and nonlinear response of strongly correlated prethermal states*
- Colloquium, JILA and Physics Department, University of Colorado, Boulder, 3/26; *An Experimental Quantum Optical Spin Glass: From Ultrametricity to Associative Memory*
- Colloquium, Physics Department Colloquium, University of Washington, Seattle, 2/26; *An Experimental Quantum Optical Spin Glass: From Ultrametricity to Associative Memory*
- Physics Department faculty meeting research talk, Stanford, 12/25; *An Experimental Quantum-Optical Spin Glass: From Ultrametricity to Associative Memory*
- Invited talk, Solid-Light Hybrids Workshop, Sponsored by Moore Foundation, CUNY Grad College, New York City, 10/25; *CavMat: Cavity-Induced Superradiance in 2D Materials*
- Invited talk, 2025 Fall Meeting of the Committee on Atomic, Molecular, and Optical Sciences (CAMOS), National Academy of Science, Irvine, CA, 10/25; *A new AMO frontier: Quantum-optical spin glass and associative memory*
- Invited talk, Crazy Cavity Workshop sponsored by QFARM, Stanford, 10/25; *An Experimental Quantum-Optical Spin Glass: From Ultrametricity to Associative Memory*
- Hot topics invited talk, BEC 2025, San Feliu, Spain, 9/25; *An Experimental Quantum-Optical Spin Glass: From Ultrametricity to Associative Memory*
- Applied Physics faculty meeting research talk, Stanford, 9/25; *An Experimental Quantum-Optical Spin Glass: From Ultrametricity to Associative Memory*

- Invited talk, US Army Focused Excursion 25-4 Quantum in 2050, Aberdeen Proving Grounds, MD, 8/25; *Quantum Feedback and the Future of Quantum*.
- Invited talk, KITP program on Noise-robust Phases of Quantum Matter, UCSB, Santa Barbara, CA, 8/25; *Quantum-Optical Spin Glass and Associative Memory*
- Invited talk, Quantum Optics and Quantum Materials Conference, Flatiron Institute, New York City, 7/25; *Quantum-Optical Spin Glasses*
- Colloquium, Princeton Quantum Colloquium, Princeton University, 3/25; *An Experimental Quantum-Optical Spin Glass: From Ultrametricity to Associative Memory*
- Seminar talk, Center for Ultracold Atoms (CUA), Harvard and MIT, Harvard University, 2/25; *Quantum-Optical Spin Glass and Associative Memory*
- Invited talk, AI + Quantum, Aspen Center for Physics, 2/25; *An Experimental Quantum-Optical Spin Glass: Replica Symmetry Breaking, Ultrametricity, and Associative Memory*
- Invited workshop talk, Stanford-hosted Moore Foundation meeting on “Workshop on Solid-Light Hybrid States of Matter,” Stanford, CA, 10/24; *CavMat: A new apparatus for using cavity-induced superradiance to affect material properties*
- Invited seminar talk to mathematicians on spin glasses and AI, Center for Communications Research-La Jolla, San Diego, CA, 9/24.
- Program review talk, ARO AMP program, Durham, NC, 6/24; *Associative memory with a quantum optical spin glass*
- Invited talk, Meeting on resonator-mediated quantum many-body physics, ETH Zürich, Switzerland, 6/24; *Replica symmetry breaking in a quantum-optical spin glass*
- Invited conference talk, Session on New Frontiers of Spinor Gases, DAMOP 2024, Ft. Worth, TX, 6/24; *A vector spin glass made of atoms and photons*
- Colloquium, Physics Department, University of California at Santa Cruz, CA, 2/24; *A quantum optical spin glass*
- Review invited talk, ARO program review, 10/23; *Phantom energy of a quenched-prethermal quantum many-body scar state*
- Review invited talk, AFOSR program review, Arlington, VA 8/23; *An optical lattice with sound*
- Colloquium, Physics Department, University of California, Berkeley, CA, 10/23; *A quantum optical spin glass*
- Invited seminar talk, Joint Quantum Institute (JQI), University of Maryland and NIST Gaithersburg, MD, 9/23; *A quantum optical spin glass*
- Invited conference talk, International Conference on Laser Spectroscopy (ICOLS), Estes Park, Colorado, 6/23; *Replica symmetry breaking in a quantum optical spin glass*
- Invited seminar talk, MIT iQuISE (Quantum Information Science and Engineering) seminar, MIT, 5/23; *Playing with quantum toys: Atomic Newton’s cradles and Archimedes’ screws*
- Colloquium, Physics Club, Department of Physics, Yale University, 5/23; *Playing with quantum toys: Atomic Newton’s cradles and Archimedes’ screws*
- Invited workshop talk, Many-body Physics with Synthetic Quantum Systems, Princeton Center for Theoretical Science (PCTS), Princeton University, 4/23; *Topological pumping into strongly correlated prethermal states, plus preliminary results on quenched dynamics of these states*
- Invited seminar talk (virtual), QuCoLiMa: Quantum Cooperativity of Light and Matter, Collaborative Research Centre Transregio, Erlangen-Nürnberg, Mainz, Saarbrücken, Germany, 1/23; *An optical lattice with sound*
- DARPA talk to DSO leadership on my research and thoughts for future programs, 11/22; *Nonequilibrium quantum many-body physics*
- QNEXT seminar talk (virtual), 10/22; *Enhancing Associative Memory Recall and Storage Capacity Using Confocal Cavity QED*

- Invited speaker, KITP conference “Noisy Intermediate-Scale Quantum Systems: Advances and Applications,” UC Santa Barbara, CA 9/22; *Enhancing Associative Memory Recall and Storage Capacity Using Confocal Cavity QED*
- Invited Symposium Speaker, session “Many-body Physics with Collective Atom-light Interactions,” DAMOP, Orlando, FL, 6/22; *An optical lattice with sound*
- Colloquium, Caltech, Pasadena, CA, 5/22; *Playing with quantum toys: Atomic Newton’s cradles and Archimedes’ screws*
- Invited Focus Session talk, APS March Meeting, Chicago, 3/22; *An optical lattice with sound*
- Colloquium, SLAC, Menlo Park, CA, 1/22; *Topological pumping into strongly correlated prethermal states*
- Colloquium, Optics and Condensed Matter Colloquium, Institute of Applied Physics (virtual), University of Bonn, Germany, 11/21; *An optical lattice with sound*
- Colloquium, Physics Department (virtual), University of Innsbruck, Austria, 11/21; *An optical lattice with sound*
- Complex Quantum Systems (CQS) seminar (virtual), University of Texas, Austin, TX, 10/21; *Topological pumping into strongly correlated prethermal states*
- Workshop invited talk, KITP conference on Non-Equilibrium Universality in Many-Body Physics, UC Santa Barbara, CA, 9/21; *An optical lattice with sound*
- Workshop invited talk (virtual), KITP workshop on Transport and Efficient Energy Conversion in Quantum Systems, UC Santa Barbara, CA, 8/21; *Topological pumping into strongly correlated prethermal states*
- Workshop invited talk (virtual), WE-Heraeus Seminar Collective Effects and Non-Equilibrium Quantum Dynamics, Bad Honnef, Germany, 6/21; *An optical lattice with sound*
- Conference invited talk (virtual), CLEO Europe, Session on Cavity-QED and Cold Gases, 6/21; *An optical lattice with sound*
- Seminar invited talk (virtual), Virtual AMO Seminar (VAMOS), 5/21; *Topological pumping of a 1D dipolar gas into strongly correlated prethermal states*
- Workshop invited talk (virtual), SPICE-Workshop on “Dissipative Phases of Entangled Quantum Matter,” U. Mainz, Germany, 5/21; *An optical lattice with sound*
- Review invited talk (virtual), ARO program review, 4/21; *An optical lattice with sound*
- Seminar invited talk (virtual), BEC Seminar in Warsaw, Center for Theoretical Physics of the Polish Academy of Sciences, Poland, 12/20; *To thermalize or not to thermalize?*
- Seminar invited talk (virtual), “Max Planck Lecture on Non-Equilibrium Quantum Phenomena” hosted by the Max Planck Institute for the Structure and Dynamics of Matter in Hamburg, Germany, 12/20; *To thermalize or not to thermalize?*
- Colloquium (virtual), Institute for Laser Physics, University of Hamburg, Germany, 12/20; *An optical lattice with sound in an active quantum gas microscope*
- Seminar PI talk (virtual), NTT PsiLab, NTT-NSF PIs, 12/20; *Confocal cavity QED for neuromorphic computation*
- Seminar invited talk (virtual) at the James Frick Institute, University of Chicago, 11/20; *To thermalize or not to thermalize?*
- Keynote conference invited talk, Conference on “Integrated Nanophotonics,” Army Science Planning and Strategy Meeting (ASPSM), 11/20; *Associative memory with confocal cavity QED*
- Conference invited talk, Conference on “Analog Computational Methods,” Virtual meeting run by U. Pitt., 8/20; *Associative memory with confocal cavity QED: Overview & Experiments*
- Conference invited talk, ICONS 2020 Quantum Reservoir Computing, Virtual meeting, 7/20; *Associative memory with confocal cavity QED*
- Review talk, ARO AMP program review, Durham, NC 1/20; *Multimode cavity QED for many-body physics: Engineering photon-mediated interactions among atoms and spins*

- Conference invited talk, SystemX Alliance Fall Conference, Stanford University, CA, 11/19; *Quantum associative memory with atoms and photons*
- Seminar invited talk at the University of Michigan, CM & AMO seminar series, Ann Arbor, MI, 11/19; *Playing with a quantum toy: Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Review talk, SRC/NSF review, UC Berkeley, CA, 8/19; *Quantum Ising machine using multimode cavity QED: Engineering photon-mediated interactions among atoms and spins*
- Review talk, AFOSR review, Arlington, VA, 7/19; *Exploring quantum thermalization with a dipolar quantum Newton's cradle*
- Seminar invited talk at Columbia University, New York, 7/19; *Playing with a quantum toy: Exploring quantum thermalization with a dipolar quantum Newton's cradle*
- Workshop invited talk for Simons Foundation Flatiron Institute workshop "Quantum Cavities and Extrinsic Insulators Workshop," New York, 7/19; *Multimode cavity QED for many-body physics: Engineering photon-mediated interactions among atoms and spins*
- Conference invited talk, KITP conference "Exploring Open Quantum Systems in Quantum Simulators," UC Santa Barbara, CA, 5/19; *Many-body cavity QED with multimode resonators*
- Conference invited talk, "CNC: Coherent Neural Computing" in Atsugi, Japan, 3/19; *Driven-dissipative neuromorphic computing with multimode cavity QED*
- Focus session invited talk, "Breakthroughs in Quantum Dynamics," APS March Meeting, Boston, MA, 3/19; *Exploring Quantum Thermalization Near Integrability in a Dipolar Quantum Newton's Cradle* (actual talk slides presented by W. Kao due to last-minute illness).
- Seminar invited talk for CUA: Center for Ultracold Atoms, Harvard and MIT, Boston, 3/19; *Many-body cavity QED with multimode resonators*
- Workshop invited talk, "Stanford/ARO Attojoule Workshop" at Stanford University, CA, 3/19; *Driven-dissipative neuromorphic computing with multimode cavity QED*
- Workshop invited talk for KITP workshop "Emerging Directions and Opportunities in Quantum Science," UC Santa Barbara, CA, 2/19; *Quantum Simulation & Sensing: Exploring new regimes of quantum many-body physics*
- Colloquium keynote invited talk for conference Nonequilibrium Physics Across Boundaries, Weizmann Institute, Rehovot, Israel, 1/19; *Playing with a quantum toy: Exploring thermalization near integrability with a magnetic quantum Newton's cradle*
- Review talk, ARO, Raleigh, NC, 11/18; *Engineering photon-mediated atom & spin interactions using multimode cavity QED*
- Conference invited talk, Conference on Many-body Dynamics and Open Quantum Systems, UK DesOEQ program, Technology and Innovation Centre of the University of Strathclyde, Glasgow, UK 10/18; *Engineering photon-mediated atom & spin interactions using multimode cavity QED*
- Conference invited talk, Advanced Light Source (ALS) Users Meeting, Lawrence Berkeley National Laboratory, Berkeley, CA, 10/18; *The SQCRAMscope: A Scanning Quantum Cryogenic Atom Microscope*
- Seminar invited talk, Physics Department, UC Santa Barbara, CA, 8/18; *The SQCRAMscope: A Scanning Quantum Cryogenic Atom Microscope*
- Conference invited talk, KITP conference on Novel Approaches to Quantum Dynamics, KITP, UC Santa Barbara, CA, 8/18; *Thermalization near Integrability in a Dipolar Quantum Newton's Cradle*
- Conference invited talk, Gordon Research Conference in Quantum Science, Stonehill College, MA, 7/18; *Engineering photon-mediated atom & spin interactions using multimode cavity QED*
- Invited talk, Stanford SU2P and SPRC workshop on Dynamics and Dissipation in Quantum Simulation, Stanford, CA, 7/18; *Many-body cavity QED with multimode resonators*
- Invited talk, KITP conference on Quantum Thermodynamics, UC Santa Barbara, CA, 6/18; *Exploring quantum thermalization with a dipolar quantum Newton's cradle*

- Seminar, Princeton University, 4/18; *Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Colloquium, Rutgers University, 4/18; *Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Seminar, Rutgers University, 4/18; *Many-body cavity QED with multimode resonators*
- Colloquium, University of California, Riverside, 3/18; *Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Seminar, Technische Universität Wien, Austria, 1/18; *Many-body cavity QED with multimode resonators*
- Seminar, U. of Stuttgart, Germany, 1/18; *Many-body cavity QED with multimode resonators*
- Colloquium, U. of Tübingen, Germany, 1/18; *Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Invited talk, WE-Heraeus-Seminar: Condensates of Light, Bad Honnef, Germany, 1/18; *Strong, tunable-length, photon-mediated interactions between BECs in multimode cavity QED*
- Colloquium, U. of California Santa Cruz, 1/18; *Exploring quantum thermalization with a magnetic quantum Newton's cradle*
- Invited talk, WE-Heraeus-Seminar: Longrange Interactions, Bad Honnef, Germany, 10/17; *Thermalization near integrability of a dipolar quantum Newton's cradle*
- Invited talk, ITAMP workshop on Many-Body Cavity QED, Harvard-Smithsonian Center for Astrophysics, 10/17; *Many-Body Cavity QED: A new tool for studying the organization of nonequilibrium quantum matter*
- SRC/NSF review talk, U. of California at Berkeley, 8/17; *Toward neuromorphic computation with spin-glassy multimode cavity QED*
- Invited talk, ICQT 2017 International Conference on Quantum Technologies, Moscow, Russia, 7/17; *Strong, tunable-interaction-range, photon-mediated interactions between BECs in multimode cavity QED*
- ARO review talk, Cocoa Beach, FL, 6/17; *Toward neuromorphic computation with spin-glass multimode cavity QED*
- Invited talk, DAMOP 2017, Sacramento, CA, 5/17; *Quantum Many-body Physics with Multimode Cavity QED*
- Invited talk, CLEO, San Jose, 5/17; *Quantum Many-body Physics with Multimode Cavity QED*
- Colloquium, James Frank Institute, University of Chicago, 5/17; *New tools for exploring nonequilibrium quantum many-body physics*
- Keynote talk, Pittsburg Quantum Institute 2017: Quantum Revolutions, Pittsburg, 4/17; *A Scanning Quantum Cryogenic Atom Microscope*
- Invited talk, SLAC-Stanford Workshop on the Frontiers of Imaging in Space and Time, Stanford University, 4/17; *A Scanning Quantum Cryogenic Atom Microscope*
- Invited talk, Focus Session on Interfacing Solid State/Nano Physics with Atomic Systems, APS March Meeting, New Orleans, 3/17; *A Scanning Quantum Cryogenic Atom Microscope*
- Invited talk, PQE-2017 Physics of Quantum Electronics, Snowbird, UT, 1/17; *Supermode-Density-Wave-Polariton Condensation*
- Summer school lecture and seminar, Thermodynamics and non-equilibrium phenomena at quantum interfaces of light and matter, University of Cambridge, UK, 9/16; *From single-atom to many-body cavity QED*
- Invited talk, Workshop on Engineering Quantum Matter: From Understanding to Control, St. Andrews, Scotland, 6/16; *Engineering quantum-optical spin glasses: Toward neuromorphic photonic computing*
- Conference talk, DAMOP 2016, Providence, RI, 5/16; *The SQCRAMscope: Scanning Quantum CRyogenic Atom Microscope*

- Invited talk, Stanford University Photonics Retreat, Marconi Conference Center, Marshall, CA, 4/16; *Engineering quantum optical spin glasses: Toward neuromorphic photonic computing*
- Colloquium, Departments of Physics and Applied Physics, Stanford University, 4/16; *Frontiers in many-body physics & neuromorphic computation with cavity QED*
- Seminar, Center for Ultracold Atoms, Harvard and MIT, Harvard University 3/16; *Observation of a supermode-polariton condensate & A long-lived spin-orbit-coupled dipolar Fermi gas*
- Symposium talk, New Directions in Quantum Emulation: California Institute for Quantum Emulation, UC Berkeley, 1/16; *Frontiers in many-body cavity QED & Observation of supermode-polariton condensate*
- Invited talk, OSA Optical Computing Incubator, Washington, D.C., 12/15; *Neuromorphic photonic computing via dissipative quantum phase transitions*
- Seminar talk, KITP DENSELIGHT workshop, UCSB, Santa Barbara, CA, 11/15; *Engineering spin glasses with multimode cavity QED*
- Colloquium, Santa Clara University, Santa Clara, CA, 10/15; *The SQCRAMscope: Probing exotic materials with quantum gases*
- Conference talk, Packard Fellows Meeting, Monterey, CA, 9/15; *Computing with neuromorphic dissipative quantum phase transitions*
- Invited talk, Workshop Synthetic Quantum Magnetism 2015, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 9/15; *Generating synthetic gauge fields in the presence of complex scattering properties*
- Invited talk, GRC Atomic Physics conference, Newport, RI, 6/15; *Introducing the SQCRAMscope: a Scanning Quantum CRYogenic Atom Microscope for imaging transport in exotic materials*
- Seminar, Cornell University, 3/15; *Quantum liquid crystals, spin glasses, and associative memory in multimode cavity QED*
- Invited lecturer, APS March Meeting 2015, San Antonio, Tutorial #5: Quantum Gases for Simulation; *From single-atom to many-body cavity QED*
- Seminar, MPS NSF Symposium, Stanford, 2/15; *Quantum simulation of complex materials*
- Conference talk, 17th annual SQuINT workshop, Berkeley, CA, 2/15; *Neuromorphic photonic computation with multimode cavity QED*
- Seminar, Weizmann Institute of Science, Israel, 1/15; *Beyond mean-field physics with multimode cavity QED*
- Colloquium, Bar-Ilan University, Israel, 1/15; *The SQCRAMscope: Scanning Quantum CRYogenic Atom Microscope*
- Seminar, Bar-Ilan University, Israel, 1/15; *Beyond mean-field physics with multimode cavity QED*
- Seminar, Ben-Gurion University, Israel, 1/15; *The SQCRAMscope: Scanning Quantum CRYogenic Atom Microscope*
- AFOSR review, single-PI presentation, Rice University, Houston, 1/15; *Universal collisions and synthetic gauges fields in Dy*
- MURI review, co-PI presentation, JQI/U. of Maryland, 12/14; *Universal collisions and synthetic gauges fields in Dy*
- Condensed Matter Seminar 290K, University of California, Berkeley, 11/14; *The SQCRAMscope: Scanning Quantum CRYogenic Atom Microscope*
- Invited talk, 2014 DOE Electron & Scanning Probe Microscopies Principal Investigators' Meeting, Gaithersburg, MD, 10/14; *Scanning quantum gas atom chip microscopy of strongly correlated and topologically nontrivial materials*
- Colloquium, Department of Physics, University of Toronto, Canada, 9/14; *The SQCRAMscope: Scanning Quantum CRYogenic Atom Microscope*
- AMO Seminar, Department of Physics, University of Toronto, Canada, 9/14; *Beyond mean-field physics with multimode cavity QED*

- Invited speaker, KITPC Symposium on “Precision Tests of Many-Body Physics with Ultracold Quantum Gases,” Beijing, China, 6/14; *Suppression of dipolar relaxation in dysprosium*
- Seminar, Cavendish Theory Seminar, University of Cambridge, England, 5/14; *Beyond mean-field physics with multimode cavity QED*
- Invited speaker, UQUAM International Workshop on Ultracold Quantum Matter, Venice, Italy, 4/14; *Embracing complexity*
- Colloquium, JILA, U. Colorado and NIST Boulder, Boulder, CO, 4/14; *Embracing complexity*
- Colloquium, Colorado School of Mines, Golden, CO, 4/14; *Embracing complexity*
- Speaker, Symposium on “Shedding light on emergent quantum phenomena,” U. Heidelberg, Germany, 3/14; *Many-body physics with quantum gases of dysprosium*
- Workshop talk, Moore-Sponsored Workshop on Emergent Quantum Materials, Carmel Valley, CA, 1/14; *Beyond mean-field physics in multimode cavity QED*
- MURI review, co-PI presentation, GaTech, 12/13; *Trapping ultracold gases near cryogenic materials and Dy update*
- Research Talk, Department of Applied Physics retreat, Stanford, 12/13; *Beyond quantum simulation: LevLab update*
- Colloquium, Departments of Physics and Electrical Engineering, Duke University, 10/13; *Quantum simulation of next-generation materials with ultracold atomic gases*
- Invited speaker, Principles and Applications of Control in Quantum Systems (PRACQSYS) conference, Monterey, Ca, 8/13; *Quantum glasses and neural networks in multimode cavity QED*
- Review speaker, DARPA Optical Lattice Emulator (OLE) Program Review, San Francisco, 5/13; *Quantum Brazovskii physics via fully emergent and compliant optical lattices*
- Speaker, Workshop on Collective Computation in Quantum Optical Systems, Stanford, 5/13; *Associative memory with cavity QED*
- Seminar, Center for International Security and Cooperation (CISAC), Stanford University, 5/13; *Quantum simulation of next-generation materials with ultracold atomic gases*
- Invited speaker, 11th Japan-US Joint Seminar on Quantum Electronics and Laser Spectroscopy (The US-Japan QEELS-11) "Ultimate Quantum Systems of Light and Matter- Control and Applications," Nara Prefecture, Japan, 4/13; *Exploring quantum soft matter with ultracold atoms*
- Invited speaker, ITAMP workshop "Finite temperature and low energy effects in cold atomic and molecular few- and many-body systems," Harvard 3/13; *Exploring quantum soft matter with ultracold atoms*
- Colloquium, Department of Physics of Rice University, Houston 3/13; *Exploring quantum soft matter with ultracold atoms*
- Seminar, JQI at the University of Maryland, 2/12; *Exploring quantum soft matter with ultracold atoms*
- Invited speaker, 43rd Winter Colloquium on The Physics of Quantum Electronics (PQE), Snowbird, Utah, 1/13; *Quantum degenerate Bose and Fermi dipolar gases of dysprosium*
- MURI review, co-PI presentation, UCSB, 12/12; *Hybrid quantum systems with Dy BECs*
- Invited speaker, ESF Research Conference on Cold and Ultracold Molecules, Obergurgl, Austria, 11/12; *Quantum degenerate Bose and Fermi dipolar gases of dysprosium*
- Invited speaker, International Conference on Quantum Gases of Polar Molecules and Magnetic Atoms, Institute for Advanced Study, Tsinghua University, Beijing, 8/12; *Quantum degenerate Bose and Fermi dipolar gases of dysprosium realized*
- Invited speaker, Hot Topics session, ICAP 2012, Paris, 7/12; *Quantum degenerate Bose and Fermi dipolar gases of dysprosium realized*
- Invited speaker, Nonequilibrium Phenomena in Ultra-cold Atoms and Strongly Interacting Photons, Princeton Center for Theoretical Science, Princeton University, 6/12; *Nonequilibrium classical and*

quantum phase transitions, supersmectics, and frustration via BECs in fully emergent and compliant optical lattices

- Invited speaker, DAMOP 2012, Orange County, CA, 6/12; *Quantum degenerate Bose and Fermi gases of dysprosium*
- Review speaker, DARPA Optical Lattice Emulator (OLE) Program Review, Chicago, 5/12; *Quantum Brazovskii physics via fully emergent and compliant optical lattices*
- Seminar, Applied Physics Optics and Electronics Seminar, Stanford University, 3/12; *Exploring quantum soft matter in an AMO setting*
- Seminar, Condensed Matter Seminar, University of California at San Diego, 3/12; *Exploring quantum soft matter in an AMO setting*
- Colloquium, University of Nevada, Reno, 3/12; *Exploring quantum soft matter in an AMO setting*
- Seminar, Condensed Matter Seminar, JILA and Department of Physics, University of Colorado, Boulder, 3/12; *Exploring quantum soft matter in an AMO setting*
- Seminar, Institute for Quantum Information and Materials, Caltech, Pasadena, CA, 3/12; *Exploring quantum soft matter in an AMO setting*
- AFOSR program review, Washington D.C., 1/12; *Realization of quantum degenerate Bose and Fermi gases of dysprosium*
- MURI review, co-PI presentation, JQI, U. of Maryland, 10/11; *Hybrid quantum systems with Dy BECs*
- Seminar, Center for Ultracold Atoms (CUA), Harvard and MIT, 10/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Colloquium, SLAC, Menlo Park, CA 10/11; *Exploring quantum soft matter with ultracold atomic gases*
- Invited speaker, BEC 2011 conference, Sant Feliu de Guixols, Costa Brava, Spain, 9/11; *Bose-Einstein condensation of the most magnetic atom, dysprosium*
- Invited lecturer, Summer School on Quantum Matter: Foundations and New Trends, University of Granada, Spain, 9/11; *Exploring soft quantum matter in an AMO setting*
- Invited speaker, Packard Fellows Meeting, Monterey, California, 9/11; *Exploring exotic soft quantum matter using emergent atom-light crystals*
- Seminar, Physics Department, Berkeley, 8/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Seminar, Center for Quantum Information and Control, University of New Mexico, 5/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Invited speaker, Workshop on Search for Topological Phases of Matter, Princeton Center for Theoretical Science, Princeton University, 4/11; *Atom chip microscopy: A novel probe for strongly correlated materials*
- Colloquium, Physics Department, University of Illinois at Urbana-Champaign, 2/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Seminar, Physics Department, University of California at Santa Barbara, 2/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Seminar, Physics Department, Princeton University, 2/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Seminar, Applied Physics Department, Stanford University, 1/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Colloquium, Physics Department, Northwestern University, Evanston, 1/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Colloquium, Physics Department, University of Washington, Seattle, 1/11; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- MURI review, co-PI presentation, JQI, U. of Maryland, 11/10; *Hybrid quantum systems with ultracold dysprosium*

- Invited speaker, Symposium honoring the 40th anniversary of Art Ashkin's laser cooling and trapping paper, OSA/DLS conference, Rochester, NY, 10/10; *Trapping ultracold dysprosium*
- Seminar, Condensed Matter Physics, Yale University, New Haven, Connecticut, 10/10; *Exploring strongly correlated matter with exotic atoms, cavity QED, and atom chips*
- Conference talk, DOE Electron and Scanning Probe Microscopies Contractors Meeting, Airlie Conference Center, Warrenton, Virginia, 10/10; *Atom chip microscopy: A novel probe for strongly correlated materials*
- Invited speaker, Hot Topics session, DAMOP 2010, Houston, 5/10; *Trapping ultracold dysprosium: A highly magnetic gas for dipolar physics*
- Colloquium, Physics Department, Georgia Tech, Atlanta, 4/10; *Exploring strongly correlated matter with exotic atoms, atom chips, and cavity QED*
- Conference talk, Twelfth Annual Southwest Quantum Information and Technology Network (SQInT) conference, Santa Fe, New Mexico, 2/10; *Trapping ultracold dysprosium*
- Seminar, Condensed, Atomic and Molecular Physics, Penn State University, State College, PA, 10/09; *Exploring strongly correlated matter with exotic atoms, cavity QED, and atom chips*
- Workshop talk, Kick-off meeting for MURI: Quantum Optical Circuits of Hybrid Quantum Memories, JQI, University of Maryland, 10/09; *Quantum information processing with dysprosium*
- Conference talk, DAMOP 2009, University of Virginia, Charlottesville, 5/09; *Quantum phase transitions, fluctuations, and stripe ordering in many-body cavity QED*
- Conference talk, DAMOP 2009, University of Virginia, Charlottesville, 5/09; *Prospects for ultracold dipolar physics, microscopy, and quantum information processing with dysprosium*
- Conference talk, DAMOP 2009, University of Virginia, Charlottesville, 5/09; *Biaxial nematic phases in ultracold dipolar Fermi gases*
- Colloquium, Physics Department, Western Illinois University, Macomb, 4/09; *Exploring exotic matter with atoms*
- Conference talk, Eleventh Annual Southwest Quantum Information and Technology Network (SQInT) conference, University of Washington, Seattle, 2/09; *Exploring exotic matter through the quantum manipulation of dipolar atoms*
- Invited speaker, 3rd annual Midwestern Cold Atom Workshop (MCAW), Argonne National Lab, Illinois, 11/08; *Exploring exotic matter through the quantum manipulation of dipolar atoms*
- Invited speaker, New Laser Scientists Conference, Rochester, New York 10/08; *Exploring exotic matter through the quantum manipulation of dipolar atoms*
- Seminar, Gas phase spectroscopy, University of Illinois at Urbana-Champaign, 3/08; *Stark decelerated OH: magnetic trapping, precision measurement, and cooling*
- Invited speaker, European Science Foundation Research Conference: Quantum optics: From photons and atoms to molecules and solid state systems, Obergurgl, Austria, 2/08; *Cooling molecules in a cavity*
- Seminar, NIST Gaithersburg, Maryland, 11/07; *Towards ultracold dipolar physics*
- Invited speaker, 2nd annual Midwestern Cold Atom Workshop (MCAW), University of Wisconsin-Madison, 11/07; *Towards ultracold dipolar physics*
- Conference talk, Annual Meeting of the Division of Atomic, Molecular, and Optical Physics (DAMOP), Calgary, Canada, 6/07; *Prospects for the cavity-assisted laser cooling of molecules*
- Seminar, University of Virginia, 4/07; *Stark decelerated OH: magnetic trapping, cooling, and dipolar qubits*
- Seminar, Oregon Center for Optics, University of Oregon, Eugene, 4/07; *Stark decelerated OH: magnetic trapping, cooling, and dipolar qubits*
- Seminar, Research Institute for Solid State Physics and Optics, Budapest, Hungary, 3/07; *Prospects for the cavity-assisted laser cooling of molecules*

- Seminar, Ultracold Atoms, University of Innsbruck, Austria, 3/07; *Stark decelerated OH: magnetic trapping, cooling, and dipolar qubits*
- Conference talk, APS March Meeting, session on Slow Molecular Beams and Quantum Optics, Denver, Colorado, 3/07; *Stark decelerated OH: magnetic trapping, precision measurement, and cooling*
- Invited speaker, Ninth Annual Southwest Quantum Information and Technology Network (SQuINT), Caltech, Pasadena, California 2/07; *Stark decelerated OH: magnetic trapping, precision measurement, and cooling*
- Invited speaker, 36th Winter Colloquium on The Physics of Quantum Electronics (PQE), Snowbird, Utah, 1/07; *Prospects for cavity-assisted laser cooling of Stark decelerated OH*
- Seminar, Quantum Information Science, University of Illinois at Urbana-Champaign, 12/06; *Stark decelerated OH: magnetic trapping, precision measurement, and prospects for ultracold polar molecules*
- Seminar, Center for Advanced Studies Seminar, University of New Mexico, Albuquerque, 12/06; *OH hyperfine structure: from precision measurement to molecular qubits*
- Invited speaker, WE-Heraeus-Seminar on Cold Molecules, Bad Honnef, Germany, 10/06; *OH hyperfine structure: From precision measurement to molecular qubits (Magnetic trapping of OH)*
- Invited speaker, Quantum Enabled Science and Technology (QUEST) Summer Workshop, Santa Fe, New Mexico, 8/06; *Stark Deceleration of OH: Towards Ultracold Dipolar Gases*
- Seminar, Los Alamos National Laboratory, New Mexico, 5/06; *Cavity QED, BECs, and Dipolar Gases: An exploration in quantum manipulation*
- Conference talk, Annual Meeting of the Division of Atomic, Molecular, and Optical Physics (DAMOP), Knoxville, Tennessee, 5/06; *Cavity QED with atom chips and microresonators*
- Colloquium, Physics Department, Williams College, Williamstown, Massachusetts, 11/05; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Seminar, Yale University, New Haven, Connecticut, 11/05; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Caltech Alumni Seminar Day, Pasadena, California 5/05; *The Atom Chip*
- Everhart Distinguished Lecture, Caltech, Pasadena, California, 5/05; *The Atom Chip*
- Invited speaker, Southwest Quantum Information and Technology Network, Tucson, Arizona, 2/05 *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Conference talk, Photonics West 2005, San Jose, California, 1/05; *Nonlinear Dynamics in Single-Atom Cavity QED*
- Colloquium, Physics Department, California State University of Long Beach, California, 1/05; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Seminar, Ion Trapping Group, NIST, Boulder, Colorado. 10/04; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Seminar, JILA, University of Colorado and NIST, Boulder, Colorado, 10/04; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Seminar, Atomic, Molecular, and Optical Sciences, U. C. Berkeley, California, 9/04; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Invited speaker, IEEE Nanoscale Devices and System Integration Conference, Miami, Florida, 2/04; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Seminar, Max Planck Institute for Quantum Optics, Garching, Germany, 10/03; *Magnetic Microtraps for Cavity QED, BECs, and Atom Optics*
- Workshop talk, MURI Kick-Off Meeting, Stanford, Palo Alto, 10/03; *Overview of Caltech MURI Center for Quantum Networks*
- Seminar, Niels Bohr Institute, Copenhagen, Denmark, 5/03; *Magnetic Microtraps for Cavity QED*
- Seminar, NIST Gaithersburg, Maryland, 3/03; *Magnetic Microtraps for Cavity QED*

- Seminar, University of Heidelberg, Germany, 1/03; *Magnetic Microtraps for Cavity QED*
- Seminar, Ludwig-Maximilians University, Munich, Germany, 1/03; *Magnetic Microtraps for Cavity QED*
- Seminar, The Max Plank Institute for Quantum Optics, Garching, Germany, 4/02; *Magnetic Microtraps for Cavity QED*
- Seminar, Ultracold atoms, University of Innsbruck, Austria, 4/02; *Magnetic Microtraps for Cavity QED*
- Seminar, University of Trento, Italy, 4/02; *Magnetic Microtraps for Cavity QED*
- Seminar, Quantum Technology, Los Alamos National Laboratory, New Mexico, 9/01; *Magnetic Microtraps for Cavity QED*

Contributed conference presentations, papers, and posters

- LevLab, poster and talk, DAMOP, Portland, Or, 6/25; *Quantum Gases of Dy in High-Finesse Multimode Cavities*
- LevLab, poster and talk, DAMOP, Portland, Or, 6/25; *Quantum-Optical Ising Spin Glass and Associative Memory*
- LevLab, poster and talk, DAMOP, Portland, Or, 6/25; *Novel apparatus for driving phonons in 2D materials with optical light*
- LevLab, poster and talk, DAMOP, Ft. Worth, Tx, 6/24; *Replica symmetry breaking in multimode cavity QED*
- LevLab, poster and talk, DAMOP, Ft. Worth, Tx, 6/24; *Phantom energy of a quenched, prethermal quantum many-body scar state*
- LevLab, poster, DAMOP, Ft. Worth, Tx, 6/24; *Novel apparatus for strongly coupling 2D materials to light*
- R. Kroeze and Z. Zhang, poster and talk for Lev Lab, ITAMP Workshop: Unravelling quantum many-body physics with long-range interacting platforms, Harvard University, 5/23; *Replica symmetry breaking in multimode cavity QED*
- H. Hunt, poster and oral talk for Lev Lab, DAMOP, Spokane, WA 6/23; *Replica symmetry breaking in multimode cavity QED*
- Z. Zhang, poster and oral talk for Lev Lab, DAMOP, Spokane, WA 6/23; *Rapidity and momentum distributions of 1D dipolar quantum gases*
- B. Marsh, seminar, University of St. Andrews, Scotland 6/22; *Driven-dissipative computation through quantum state diffusion in the multimode Dicke model*
- K. Wang, talk and poster for Lev Lab, DAMOP, Orlando 6/22; *Measuring Rapidities of a Bosonic Dipolar 1D Quantum Gas in Tonks and Super-Tonks Regimes*
- B. Marsh, talk and poster for Lev Lab, DAMOP, Orlando 6/22; *Approaching Ising problems with multimode cavity QED*
- B. Marsh, NTT/NSF seminar for Lev Lab, 6/21; *Approaching Ising problems with multimode cavity QED*
- R. Kroeze, virtual talk and poster for Lev Lab, APS DAMOP 2021; *Spin- and atom-interactions in multimode cavity QED*
- K.-Y. Lin, virtual talk and poster for Lev Lab, APS DAMOP 2021; *Topological pumping of a 1D dipolar gas into strongly correlated prethermal states*
- B. Freudenstein, virtual talk and poster for Lev Lab, APS DAMOP 2021; *Demonstrating the 6 K measurement capability of an improved scanning quantum cryogenic atom microscope*
- S. Taylor, virtual talk and poster for Lev Lab, APS March Meeting 2021; *A scanning quantum cryogenic atom microscope at 6 K*
- F. Yang, virtual talk and poster for Lev Lab, APS March Meeting 2021; *Imaging Nematic Transitions in Iron-Pnictide Superconductors with a Quantum Gas*
- F. Yang, virtual conference talk for Lev Lab, Quantum Technology meets Quantum Matter, CEMS Topical Meeting Online, RIKEN CEMS, Japan, 9/20; *Imaging nematic transitions in iron-pnictide superconductors with a quantum gas*

- R. Kroeze, Y. Guo, B. Marsh, J. Keeling, and B. L. Lev, virtual talk and poster, DAMOP, Portland, OR, 6/20; *Spin- and atom-interactions in multimode cavity QED*
- Y. Guo, R. Kroeze, B. Marsh, J. Keeling, and B. L. Lev, seminar talk, University of Cambridge, UK, 10/19; *Many-body physics with multimode cavity QED*
- B. Marsh, Y. Guo, R. Kroeze, S. Gopalakrishnan, S. Ganguli, J. Keeling, and B. L. Lev, seminar talk, U. of St. Andrews, UK, 10/19; *Hopfield-like associative memories with multimode cavity QED*
- Y. Guo, R. Kroeze, B. Marsh, J. Keeling, and B. L. Lev, seminar talk, U. of St. Andrews, UK, 10/19; *Many-body physics with multimode cavity QED*
- S. Taylor, F. Yang, S. Edkins, J. Palmstrom, I. Fisher and B. L. Lev, talk, Bay Area Cold Atoms Workshop (BACAM), 8/19; *Imaging Imaging Nematic Transitions in Iron-Pnictide Superconductors with a Quantum Gas*
- R. Kroeze, Y. Guo, J. Keeling, and B. L. Lev, poster, GRC Atomic Physics, Salve Regina University, Newport, RI, 6/19; *Spin and atom interactions in multimode cavity QED*
- B. L. Lev, K.-Y. Li, W. Kao, and K.-Y. Lin, poster, GRC Atomic Physics, Salve Regina University, 6/19; *Exploring a dipolar Luttinger liquid from the Tonks to the super-Tonks regimes*
- R. Kroeze, Y. Guo, J. Keeling, and B. L. Lev, talk and poster, DAMOP, Milwaukee, 6/19; *Spin and atom interactions in multimode cavity QED*
- K.-Y. Li, W. Kao, K.-Y. Lin, and B. L. Lev, talk and poster, DAMOP, Milwaukee, 6/19; *Exploring a dipolar Luttinger liquid from the Tonks to the super-Tonks regimes*
- F. Yang, S. Edkins, S. Taylor, J. Palmstrom, I. Fisher and B. L. Lev, talk, APS March Meeting, Boston, MA, 3/19; *The SQCRAMscope*
- Y. Guo, R. Kroeze, J. Keeling, and B. L. Lev, talk, Workshop on Correlations and Entanglement with Photons in Cavities, Chicheley Hall, the Royal Society Venue in Buckinghamshire, UK, 9/18; *Engineering photon-mediated atom & spin interactions using multimode cavity QED*
- S. Edkins F. Yang, S. Taylor, and B. L. Lev, poster, M²S-2018, 12th International Conference on Materials and Mechanisms of Superconductivity and High-Temperature Superconductors, Beijing, China, 8/18; *The SQCRAMscope: Scanning Quantum Cryogenic Atom Microscope*
- R. Kroeze, Y. Guo, J. Keeling, and B. L. Lev, talk, Workshop on Workshop on Quantum Simulations with Atoms and Light, CQOM/ITAMP Workshop, Aarhus Institute of Advanced Studies, Aarhus University, Denmark, 8/18; *Engineering photon-mediated atom & spin interactions using multimode cavity QED*
- Y. Guo, V. Vaidya, R. Kroeze, J. Keeling, and B. L. Lev, talk, BACAM meeting, Stanford, 8/18; *Tunable-Range, Photon-Mediated Atomic Interactions in Multimode Cavity QED*
- S. Taylor, F. Yang, S. Edkins, and B. L. Lev, talk and poster, International Conference on Magnetism, San Francisco, CA, 7/18; *The SQCRAMscope: Scanning Quantum Cryogenic Atom Microscope*
- Y. Guo, V. Vaidya, R. Kroeze, J. Keeling, and B. L. Lev, talk, NSF and SRC review meeting, Berkeley, 7/18; *Tunable-Range, Photon-Mediated Atomic Interactions in Multimode Cavity QED*
- K.-Y. Li, W. Kao, Y. Tang, K. Mallayya, M. Rigol, S. Gopalakrishnan, and B. L. Lev, poster, GRC on Quantum Science, Stonehill College, MA, 7/18; *Thermalization near integrability in a dipolar quantum Newton's cradle*
- Y. Guo, V. Vaidya, R. Kroeze, K. Ballantine, A. Kollár, J. Keeling, and B. L. Lev, talk and poster, DAMOP, Ft. Lauderdale, 6/18; *Tunable-Range, Photon-Mediated Atomic Interactions in Multimode Cavity QED*
- W. Kao, Y. Tang, K.-Y. Li, S. Seo, K. Mallayya, M. Rigol, S. Gopalakrishnan, and B. L. Lev, talk and poster, DAMOP, Ft. Lauderdale, 6/18; *Thermalization near integrability in a dipolar quantum Newton's cradle*
- B. L. Lev, poster, BEC 2017, Sant Feliu, Spain, 9/17; *Thermalization near integrability in a dipolar quantum Newton's cradle*
- Y. Tang, B. L. Lev, talk, BACAM 2017 (Bay Area Cold Atom Meeting), Bekeley, CA, 7/17; *Thermalization near integrability in a dipolar quantum Newton's cradle*

- Y. Tang, A. Sykes, N. Burdick, D. Petrov, and B. L. Lev, talk and poster, DAMOP, Sacramento, 6/17; *Manifestations of dipolar collisions in thermal and BEC gases of dysprosium*
- V. Viadva, Y. Guo, A. Kollár, K. Ballantine, J. Keeling, and B. L. Lev, talk and poster, DAMOP, Sacramento, 6/17; *Quantum Many-Body Physics with Multimode Cavity QED*
- F. Yang, A. Kollár, S. Taylor, J. Palmstrom, I. Fisher, and B. L. Lev, talk and poster, DAMOP, Sacramento, 6/17; *SQCRAMscope imaging of transport in an iron-pnictide superconductor*
- A. Kollár, B. L. Lev talk, Quantum Innovators Workshop, Institute for Quantum Computing (IQC) at the University of Waterloo, 10/16; *Self-organization in multimode cavity QED and Magnetometry with 1D Bose-Einstein Condensates*
- A. Kollár, V. Vaidya, Y. Guo, and B. L. Lev, poster Quantum Science GRC, Stonehill College, Easton, MA, 8/16; *Observation of Supermode-Density-Wave-Polariton Condensation*
- A. Kollár, F. Yang, S. Taylor, poster, Quantum Science GRC, Stonehill College, Easton, MA, 8/16; *The SQCRAMscope*
- N. Burdick, Y. Tang, W. Kao, and B. L. Lev, poster, Quantum Science GRC, Stonehill College, Easton, MA, 8/16; *A Long-Lived Spin-Orbit-Coupled Dipolar Fermi Gas*
- A. Kollár, V. Vaidya, Y. Guo, and B. L. Lev, poster, Stanford University, 8/16; *Observation of Supermode-Density-Wave-Polariton Condensation*
- A. Kollár, F. Yang, S. Taylor, poster, BACAM 2016, Stanford University, 8/16; *The SQCRAMscope*
- Y. Tang, N. Burdick, W. Kao, and B. L. Lev, talk, BACAM 2016, Stanford University, 8/16; *Dipolar physics with quantum gases of dysprosium*
- N. Burdick, Y. Tang, W. Kao, and B. L. Lev, poster and talk, DAMOP 2016, Providence, RI, 5/16; *A Long-Lived Spin-Orbit-Coupled Dipolar Fermi Gas*
- A. Kollár, A. Papageorge, Y. Guo, V. Vaidya, and B. L. Lev, poster and talk, DAMOP 2016, Providence, RI, 5/16; *Observation of a Supermode-Polariton Condensate*
- F. Yang, A. Kollár, S. Taylor, and B. L. Lev, poster and talk, DAMOP 2016, Providence, RI, 5/16; *Scanning Cryogenic Magnetometry with a Bose-Einstein Condensate*
- B. L. Lev, poster, MURI review "New Quantum Phases of Matter" and "Fundamental Issues in Non-Equilibrium Dynamics," UC Berkeley, 1/16; *Observation of supermode-polariton condensate*
- B. L. Lev, poster, New Directions in Quantum Emulation: California Institute for Quantum Emulation, UC Berkeley, 1/16; *Long-lived spin-orbit-coupled dipolar Fermi gas*
- B. L. Lev, poster, Packard Fellows Meeting, Monterey, California, 9/15; *An adjustable-length, cavity apparatus for multimode cavity QED*
- J. DiSciaccia and B. L. Lev, talk Bay Area Cold Atoms Workshop, Berkeley, CA, 8/15; *The SQCRAMscope: Scanning Quantum Cryogenic Atom Microscope*
- A. Kollár and B. L. Lev, talk, POLATOM meeting, Physikzentrum Bad Honnef, Germany, 6/15; *Beyond mean-field physics with multimode cavity QED*
- J. DiSciaccia, R. Turner, S. Qiao, J. Straquadine, and B. L. Lev, poster, Gordon Research Conference, Salve Regina University, Newport, RI, 6/15; *The SQCRAMscope: Scanning Quantum Cryogenic Atom Microscope*
- A. Papageorge, A. Kollár, and B. L. Lev, poster and talk, DAMOP, Columbus, OH, 6/15; *A Multimode Cavity QED Apparatus with a Rubidium BEC*
- Y. Tang, N. Burdick, J. DiSciaccia, and B. L. Lev, poster and talk, DAMOP, Columbus, OH, 6/15, Stonehill College, Easton, MA 7/14; *Ultracold collisions in dysprosium*
- S. Qiao, R. Turner, J. DiSciaccia, and B. L. Lev, poster and talk, APS March Meeting 2015, San Antonio, Tx, 3/15; *The SQCRAMscope: Scanning Quantum Cryogenic Atom Microscope*
- B. L. Lev, poster, 2014 DOE Electron & Scanning Probe Microscopies Principal Investigators' Meeting, Gaithersburg, MD, 10/14; *Scanning quantum gas atom chip microscopy of strongly correlated and topologically nontrivial materials*

- B. L. Lev, poster, Packard Fellows Meeting, Monterey, California, 9/14; *Exploring exotic soft quantum matter using emergent atom-light crystals*
- A. Kollár, A. Papageorge, and B. L. Lev, poster, ICAP, Washington, DC, 8/14; *Multimode cavity QED*
- S. Qiao, R. Turner, J. DiSciaccia, and B. L. Lev, poster, ICAP, Washington, DC, 8/14; *A cryogenic quantum gas scanning magnetic microscope*
- J. DiSciaccia, R. Turner, S. Qiao, and B. L. Lev, poster, GRC Quantum Science, Stonehill College, Easton, MA 7/14; *A cryogenic quantum gas scanning magnetic microscope*
- Y. Tang, N. Burdick, K. Baumann, M. Lu, and B. L. Lev, poster, GRC Quantum Science, Stonehill College, Easton, MA 7/14; *Fermionic suppression of dipolar relaxation*
- A. Papageorge, A. Kollár, and B. L. Lev, poster, GRC Quantum Science, Stonehill College, Easton, MA 7/14; *Multimode cavity QED*
- K. Baumann, N. Q. Burdick, M. Lu, and B. L. Lev, talk & poster, DAMOP, Madison, WI, 6/14; *Low-field Feshbach resonances in dysprosium*
- N. Q. Burdick, K. Baumann, M. Lu, Y. Tang, H. Zhai, T.-L. Ho, X. Cui, B. Lian, and B. L. Lev, talk, DAMOP, Madison, WI, 6/14; *Prospects for generating large synthetic gauge fields in dysprosium quantum gases*
- R. Turner, M. Naides, R. Lai, J. DiSciaccia, and B. L. Lev, talk & poster, DAMOP, Madison, WI, 6/14; *A cryogenic quantum gas scanning magnetic microscope*
- R. Wilson, S. Gopalakrishnan, B. Anderson, B. Lev, I. Martin, E. Demler, and C. Clark, talk, DAMOP, Madison, WI, 6/14; *Exotic Phases of Rashba Spin-Orbit Coupled Dipolar Bosons*
- H. Zhai & B. L. Lev Focus session talk, APS March meeting, Denver, CO, 3/14; *Synthetic gauge fields in quantum gases of dysprosium*
- J. DiSciaccia, M. Naides, R. Turner, R. Lai & B. L. Lev, poster, *A cryogenic quantum gas scanning magnetic microscope*, APS March Meeting, Denver, CO, 3/14
- M. Naides, R. Turner, R. Lai, J. DiSciaccia & B. L. Lev, talk, *A cryogenic quantum gas scanning magnetic microscope*, APS March Meeting, Denver, CO, 3/14
- B. L. Lev, *Exploring exotic soft quantum matter using emergent atom-light crystals*, poster Packard Fellows 25th Anniversary Meeting, Denver, CO, 9/13
- K. Baumann & B. L. Lev, poster, BEC 2013 conference, Sant Feliu de Guixols, Costa Brava, Spain, 9/13; *Quantum Gases of Dysprosium*
- N. Burdick, M. Lu, K. Baumann, & B. L. Lev, poster, *Quantum Gases of Dysprosium*, GRC Atomic Physics, Regina University, Rhode Island, 6/13
- M. Naides, R. Turner, R. Lai, & B. L. Lev, poster, *Cryogenic atom chip microscopy*, GRC Atomic Physics, Regina University, Rhode Island, 6/13
- N. Burdick, M. Lu, K. Baumann, & B. L. Lev, poster, *Quantum Gases of Dysprosium*, DAMOP annual meeting, Quebec City, Canada 6/13
- M. Naides, R. Turner, R. Lai, & B. L. Lev, poster, *Cryogenic atom chip microscopy*, DAMOP annual meeting, Quebec City, Canada 6/13
- M. Lu & B. L. Lev, invited talk, *Quantum degenerate Bose and Fermi dipolar gases of dysprosium*, Hangzhou Workshop on Quantum Matter, Zhejiang University, Hangzhou, China 4/13
- S. Gopalakrishnan, B. L. Lev, & P. Goldbart, invited talk, *Frustration in spin models with cavity-mediated interactions*, DAMOP annual meeting, Quebec City, Canada 6/13
- M. Lu & B. L. Lev, invited talk, *Quantum degenerate Bose and Fermi dipolar gases of dysprosium*, SQuINT annual meeting, Santa Barbara 2/13
- K. Baumann & B. L. Lev, invited talk, *Quantum degenerate Bose and Fermi dipolar gases of dysprosium*, 5th INTERNATIONAL Conference on Control of quantum correlations in tailored matter: Common perspectives of mesoscopic systems and quantum gases; Schloss Reinsburg, Günzburg, Germany, 11/12

- B. L. Lev, *Atom chip microscopy: A novel probe for strongly correlated materials*, poster DOE Electron and Scanning Probe Microscopies Contractors Meeting, Germantown, VA, 10/12
- B. L. Lev, *Exploring exotic soft quantum matter using emergent atom-light crystals*, poster Packard Fellows Meeting, Monterey, California, 9/12
- B. L. Lev, *Supersmectic, Superglass, and Spin-Glass Phases in Multimode cQED*, poster DARPA YFA kick-off meeting, Arlington, VA, 7/12
- A. Kollár, A. Papageorge, S. Gopalakrishnan, P. Goldbart, and B. L. Lev, *Supersmectic, Superglass, and Spin-Glass Phases in Multimode cQED*, poster DAMOP 2012, Orange County, CA, 6/12
- M. Lu, N. Q. Burdick, K. Baumann, and B. L. Lev, *Quantum degenerate Bose and Fermi dipolar gases of dysprosium realized*, poster DAMOP 2012, Orange County, CA, 6/12
- A. Kollár and B. L. Lev, invited talk, *Exploring Strongly Correlated Matter with Multimode Cavity QED*, 42nd Winter Colloquium on the Physics of Quantum Electronics (PQE), Snowbird, UT, 1/12
- M. Lu and B. L. Lev, invited talk, Workshop on Ultracold Molecules, National Institute for Theoretical Physics (NITheP) in Stellenbosch, South Africa, 11/11; *Exploring quantum liquid crystal physics with ultracold dysprosium*
- N. Burdick and B. L. Lev, invited talk, *Strongly Dipolar BECs of Dysprosium*, MCAW 2011, Northwestern University, 11/11
- A. Kollár and B. L. Lev, invited talk, *Exploring Strongly Correlated Matter with Multimode Cavity QED*, SPRC 2011 Annual Symposium, Stanford, 9/11
- S.-H. Youn, M. Lu, N. Burdick, and B. L. Lev, *Narrow-line cooling and the optical dipole trapping of dysprosium*, Focus Session talk, Dipolar Quantum Gases, DAMOP 2011, Atlanta, 6/11
- M. Lu, S.-H. Youn, R. W. Turner, M. Naides, N. Burdick, A. Kollár, N. Redmon, and B. L. Lev, *Exploring strongly correlated matter with exotic atoms*, poster DAMOP 2011, Atlanta, 6/11
- M. Naides, R. W. Turner, and B. L. Lev, *Atom chip microscopy*, talk MCAW 2010, U. of Michigan, 11/10.
- S.-H. Youn, M. Lu, N. Burdick, and B. L. Lev, *Laser cooling and trapping Dy*, poster MCAW 2010, U. of Michigan, 11/10.
- B. L. Lev, M. Lu, and S.-H. Youn, *Laser cooling and trapping Dy*, in Frontiers in Optics (FIO)/Laser Science (LS) (Optical Society of America, Washington, DC, 2010), STuD4.
- B. Kasch, M. Naides, R. Turner, U. Ray and B. L. Lev, *Atom chip microscopy: A novel probe for strongly correlated materials*, poster U. Michigan Summer School, Ann Arbor, 8/10
- S.-H. Youn, M. Lu, and B. L. Lev, *Laser cooled and trapped Dy: MOT dynamics, collisions, and progress toward narrow-line cooling*, poster U. Michigan Summer School, Ann Arbor, 8/10
- B. Kasch, M. Naides, R. Turner, U. Ray and B. L. Lev, *Atom chip microscopy: A novel probe for strongly correlated materials*, poster DAMOP 2010, Houston, 5/10
- S.-H. Youn, M. Lu, and B. L. Lev, *Laser cooled and trapped Dy: MOT dynamics, collisions, and progress toward narrow-line cooling*, poster DAMOP 2010, Houston, 5/10
- S. Gopalakrishnan, D.-Z. Rocklin, B. L. Lev, and P. Goldbart, session talk, *Photons as phonons: Flexible crystals of atoms and light in multimode cavities*, APS March Meeting 2010, Portland, Oregon, 3/10
- S.-H. Youn, M. Lu, and B. L. Lev, *Trapping ultracold dysprosium: A highly magnetic gas for dipolar physics*, poster, Air Force Office of Scientific Research (AFOSR) Atomic & Molecular Physics Program review, Washington, D.C., 1/10
- S. M. Kobtsev, B. Lev, J. Fortagh, and V. Baraulya, *Powerful narrow-line source of blue light for laser cooling Yb/Er and Dysprosium atoms*, Poster in LASE SPIE Photonics West conference, San Francisco, 1/10
- S.-H. Youn, M. Lu, and B. L. Lev, *Laser cooled and trapped Dy: MOT dynamics, collisions, and progress toward narrow-line cooling*, poster MCAW 2009, U. of Chicago, 11/09
- S. Gopalakrishnan, B. L. Lev, P. M. Goldbart, and S. Lal, *Quantum solids and impurity models with ultracold atoms*, poster, Workshop on Quantum Materials at the Nanoscale 2009, U. of Illinois, 9/09

- S.-H. Youn, M. Lu, U. Ray, B. Lev, *Ultracold dipolar physics with dysprosium*, poster DAMOP 2009, University of Virginia, Charlottesville, 5/09
- S. Gopalakrishnan, B. Lev, and P. Goldbart, ESF-coordinated European EUROQUAM research network CMMC (Cavity mediated molecular cooling) Workshop on “Cavity Cooling of Atoms, Molecules, and Ions,” Obergurgl, Tirol, Austria, 2/09, *Quantum Phase Transitions and Frustration of Ultracold Gases in Multimode Cavities*
- B. M. Fregoso, K. Sun, E. Fradkin, and B. L. Lev, *Fermi surface distortions in a neutral Fermi fluid with dipolar interactions*, APS March Meeting, Pittsburgh, 3/09
- S. Gopalakrishnan, B. L. Lev, and P. Goldbart, *Quantum fluctuations and self-organization of a BEC in a multimode optical cavity*, APS March Meeting, Pittsburgh, 3/09
- S.-H. Youn, M. Lu, U. Ray, and B. L. Lev, *Exploring exotic matter through the quantum manipulation of dipolar atoms*, 3rd annual Midwestern Cold Atom Workshop (MCAW), Argonne National Lab, Illinois, 11/08
- B. Sawyer, B. Stuhl, M. Yeo, D. Wang, B. Lev, and J. Ye, “Collision experiments utilizing trapped neutral OH molecules,” 39th Annual Meeting of the Division of Atomic, Molecular & Optical Physics (DAMOP), American Physical Society, State College, Pennsylvania, May 27 – 31, 2008. (C4 10) Bulletin Am. Phys. Soc. 53, No. 7, pp. 26.
- B. Stuhl, B. Sawyer, M. Yeo, D. Wang, B. Lev, and J. Ye, “A wide-open molecular magnetic trap for collision studies,” 39th Annual Meeting of the Division of Atomic, Molecular & Optical Physics (DAMOP), American Physical Society, State College, Pennsylvania, May 27 – 31, 2008. (R1 119) Bulletin Am. Phys. Soc. 53, No. 7, pp. 159.
- B. Sawyer, B. Stuhl, B. Lev, M. Yeo, D. Wang, and J. Ye, “Magnetoelectrostatic trapping of neutral OH molecules,” American Physical Society March Meeting, New Orleans, Louisiana, March 10 – 14, 2008. Program Guide pp. 114.
- B. Lev, Poster, 18th International Conference on Laser Spectroscopy (ICOLS), Telluride, Colorado, 6/07
- B. C. Sawyer, B. L. Lev, E.R. Hudson, B. K. Stuhl, M. Lara, J. L. Bohn, and J. Ye, *Magneto-electrostatic trapping of Stark decelerated OH*, P4.00007 DAMOP Calgary, Alberta, Canada, 5/07.
- M. Lara, B. Lev, B. Sawyer, J. Ye, and J. L. Bohn, “Dynamics of OH in a magneto-electrostatic trap,” 2007 Annual Meeting of the Division of Atomic, Molecular and Optical Physics (DAMOP), American Physical Society, Calgary, Canada, June 5 – 9, 2007. (K1 104) Bulletin Am. Phys. Soc. 52, No. 7, pp. 107.
- B. Lev, E. Meyer, E. Hudson, B. Sawyer, J. Bohn, and J. Ye, “Precision measurement of OH structure using Stark deceleration,” 20th International Conference on Atomic Physics (ICAP 2006), Innsbruck, Austria, July 16 – 21, 2006. Book of abstracts, p. 570.
- E. R. Hudson, B. Sawyer, B. Lev, and Jun Ye, “Precision spectroscopy with cold molecules,” Training School and Workshop on Achievements and Perspectives of Cold Molecules (COMOL’06/CATS’06), Les Houches, France, February 26 – March 10, 2006.
- B. Lev, Poster, Atomic Physics Gordon Research Conference, Tilton, New Hampshire, 6/05
- B. Lev, Poster, Southwest Quantum Information and Technology Network 6th Annual Meeting, UCSD, San Diego, California, 2/04
- B. Lev, Poster, Atomic Physics Gordon Research Conference, Tilton, New Hampshire, 6/03
- B. Lev, Poster, Southwest Quantum Information and Technology Network 5th Annual Meeting, LANL, Santa Fe, New Mexico, 2/03
- B. Lev, Poster, 18th International Conference on Atomic Physics, MIT, Boston, Massachusetts, 7/02
- B. Lev, Poster, Southwest Quantum Information and Technology Network 4th Annual Meeting, NIST, Boulder, Colorado, 3/02
- B. Lev, Poster, Southwest Quantum Information and Technology Network 3rd Annual Meeting, Caltech, Pasadena, California, 3/01