Prof. James K. Thompson
Curriculum Vitae

JILA& Dept. of Physics
440 UCB, JILA X429
Boulder, Colorado 80309-0440

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Present Position
JILA/NIST & Dept. of Physics, University of Colorado at Boulder
JILA Associate Chair (2026-present)
JILA Fellow and Professor, Adjoint (2019-present)
JILA Fellow and Associate Professor, Adjoint (2013-2019)
Associate Fellow and Assistant Professor, Adjoint (Sept. 2006 to June 2013)

Postdoctoral Position
Massachusetts Institute of Technology Cambridge, MA
MIT-Harvard Center for Ultracold Atoms with Vladan Vuletić (2003-2006)

Education
Massachusetts Institute of Technology, Ph.D. Cambridge, MA
Ph.D. Physics, advisor David E. Pritchard (1997 - 2003)
"Two-Ion Control and Polarizations Forces for Precise Mass Comparisons"

Florida State University, B.A., M.S. Tallahassee, FL
M.S. Physics, 1997, Laser spectroscopy of helium-like ions
B.A. Physics, 1995, *Sum. Cum Laude*, Honors in Liberal Studies and in Major

Awards
2018 Fellow of the American Physical Society
2013 Department of Commerce Bronze Medal
2004 DAMOP Doctoral Thesis Prize
Barry M. Goldwater Scholar in Mathematics, Science and Engineering
Phi Beta Kappa Marion Jewell Hay Award for Academic Excellence
Florida State University Sr., Jr. and Soph. of the Year Academic Awards
National Merit Scholar

Selected Publications

"Realization of three and four-body interactions between momentum states in a cavity through optical dressing,"
Science, vol. 390, no. 6776, pp. 925–929, Nov. 2025

"A Dissipation-Induced Superradiant Transition in a Strontium Cavity-QED System,"
Song et al, *Science. Advances.*, *11* (17), eadu5799, (Apr. 2025)

"Engineering of Collective XYZ Spin Models in an Optical Cavity,"
Luo et al, *Nature Physics* 1–8 (April 2025)

"Continuous Recoil-Driven Lasing and Cavity Frequency Pinning with Laser-Cooled Atoms,"
Schäfer et al, *Nature Physics* 1–7 (April 2025)

"Momentum-Exchange Interactions in a Bragg Atom Interferometer Suppress Doppler Dephasing,"
Luo et al, *Science* **384**, no. 6695, 551–56 (May 2024)

"Observing Dynamical Phases of a Bardeen-Cooper-Schrieffer Superconductor in a Cavity QED Simulator,"
Young et al, *Nature* **625** 679-684 (Jan 2024)

"Direct comparison of two spin squeezed optical clocks below the quantum projection noise limit,"
Robinson et al, *Nature Physics* 1-6 (Jan 2024)
"Entanglement-enhanced matter-wave interferometry in a high-finesse cavity,"
Greve, Luo *et al*, *Nature*, 610, 472–477, (2022)
"Exploring dynamical phase transitions with cold atoms in an optical cavity,"
Muniz *et al, Nature* 580 602-607 (2020)
"Cavity mediated collective spin exchange interactions in a Sr superradiant laser," Norcia *et al, Science* 361, 259-262 (2018)
"Frequency measurements of superradiance from the strontium clock transition,"
Norcia *et al*, *Phys. Rev. X* 8, 021036 (2018)
"Narrow-line laser cooling by adiabatic transfer,"
Norcia *et al, New J. Phys.* 20 023021 (2018)
"Role of atoms in atomic gravitational-wave detectors,"
Norcia *et al, Phys. Rev. A* 96, 042118 (2017)
"Superradiance on the millihertz linewidth strontium clock transition,"
Norcia *et al, Science Advances* 2016;2:e1601231 (2016)
"A cold-strontium laser in the superradiant crossover regime,"
Norcia *et al, Phys. Rev. X* 6, 011025 (2016)
"Deterministic squeezed states with collective measurements and feedback,"
Cox *et al, Phys. Rev. Lett*. 116, 093602 (2016)
"Reduced spin measurement back-action for a phase sensitivity 10 x beyond the SQL,"
Bohnet *et al*, *Nature Photonics* 8, 731-736 (2014)
"A steady state superradiant laser with <1 intracavity photon,"
Bohnet *et al, Nature* 484 78-81 (2012)
"A High-Brightness Source of Narrowband, Identical-Photon Pairs," Thompson, Simon *et al, Science*, 313, 74–77 (2006)
"A direct test of $E= mc^2$," Rainville, Thompson *et al*
Nature, 438, 1096–1097 (2005)
"Cyclotron frequency shifts arising from polarization forces," Thompson, Rainville *et al, Nature* 430, 58–61 (2004)
"An Ion Balance for Ultra-High-Precision Atomic Mass Measurements,"
Rainville, Thompson *et al*, *Science*, 303, 334–338 (2004)

Funding Sources

NSF, NIST, DARPA, ARO, ONR, DOE, AFOSR, Lockheed, Heising-Simons

Service

JILA Associate Chair, Feb. 2026
DAMOP Abstract Sorter, Feb. 2026
DAMOP/DLS New Laser Scientist Conference co-organizer, present to Nov. 2025.
CU Physics graduate admissions committee, 2007 to present
CU Physics Graduate Mentoring committee, Fall 2025 to present
CU Physics PUEC committee, Fall 2024
JILA Electronics Shop Fellow Supervisor 2019-present
JILA Building Committee 2015 - present

JILA Visiting Fellow Secretary 2014 - present
CUBit Advisory Board 2019- present
QLCI Quantum Leap Challenge Institute Executive Committee 2020- present
JILA Faculty Hiring Search, Committee Chair Fall 2023 to Spring 2024
CU Physics Graduate Comprehensive Examination Committee Fall 2017-Spring 2023
JILA Beautification Committee 2008 to 2012
JILA Vision Committee 2021 – 2022
QLCI Quantum Forge Fall 2021 – Spring 2022
International Conference on Laser Spectroscopy, co-Chair June 2021. 2019- 2023
Aspen Winter Conference on "Many-Body Cavity QED", December 2021, organizing committee
JILA Visiting Fellow committee 2012 to 2014
JILA/Physics Faculty Search Committee 2018/2019 (Quantum Information Science)
Aspen Winter Conference on Cavity QED Quantum Many Body Physics Co-organizer (Dec 2021)
ICOLS 2021 Celebration (Virtual), Co-organizer (June 2021)
US/Japan Seminar on Atomic Physics Co-organizer 2018
APS Topical Group on Precision Measurement & Fundamental Constants
Executive Committee Member at Large 6/2016- 3/2019
CU Physics R3 Committee Fall 2017-Spring 2018
JILA Faculty Hiring Committee 2016/2017
JILA Academic Review and Planning Advisory Committee ARPAC 2016/17
CU Honors Council 2013-2015
CU Physics Honors Committee 2013-2015
CU Physics Graduate Committee 2006-2013, 2015-2019
Visiting Graduate Student AMO/CM/Bio/PER Overview Talks 2012-2018
Graduate Research Opportunities AMO for incoming students 2016, 2017
Coordinated Selection of Katharine Burr Blodgett Fellowship Recipients 2013
Review Panel ESF's EuroQUASAR, NSF Physics at the Information Frontier
NSF, NSSEFF Fellows program reviewer
Reviewer for *Science, Nature, Nature Photonics, Physical Review Letters, Physical Review X, Optics Letters, Optics Express, Applied Physics Letters, J. of Optical Society B, New J. Physics,* etc.

Teaching & Education

PHYS2170 Intro. to Modern Physics, Spring 2026
PHYS2170 Intro. to Modern Physics, Spring 2024
PHYS7560 Graduate Quantum Optics Spring 2023
PHYS3330 Junior Electronics Spring 2022
PHYS3330 Undergraduate Electronics Spring 2021
PHYS7560 Graduate Quantum Optics Spring 2020
PHYS4430/5430 Undergraduate Advanced Laboratory Spring 2019
PHYS4430/5430 Undergraduate Advanced Laboratory Spring 2017
PHYS7xxx 2 Graduate Quantum Optics: guest lectures Spring 2017
PHYS4610/420/4630 Physics Honors Seminar Spring 2015
PHYS4510 Undergraduate Optics, guest lecture Fall 2015
PHYS7xxx 2 Graduate Quantum Optics: guest lectures Spring 2015
PHYS3220 Undergraduate Quantum Mechanics: guest lecture

PHYS4610/420/4630 Physics Honors Seminar Fall 2013
PHYS7810-006 Graduate Quantum Optics Spring 2013
PHYS3330 Undergraduate Electronics Fall 2010
PHYS3330 Undergraduate Electronics Fall 2009
REU advisor summers 2015, 2014, 2012, 2009, 2008
PhD Thesis Defenses: 60+
PhD Comprehensive Examination III: 60+
PhD Comprehensive Examination II: 60+
Honors Thesis Defenses: 12

Previous PhD Students

2013 Zilong Chen
2014 Justin G. Bohnet
2015 Joshua M. Weiner
2016 Kevin C. Cox
2017 Matthew A. Norcia
2021 Baochen Wu
2021 Graham P. Greve
2021 Julia R.K. Cline
2024 Chengyi Luo
2025 Dylan Young

Previous Postdocs

2017 to October 2019 Juan Muñiz-Silva
2021 to 2023 Vera Schäfer

Present Group

2024 Eliot Bohr —postdoc
2025 Joyce Kwan—postdoc
2025 David Nak—postdoc
2021 Eric Yilun Song—PhD student
2021 Zhijing Niu—PhD student
2023 Braden Larsen—PhD student
2024 Hagan Hensley—PhD student
2023 Chitose Maruko—PhD student
2024 Cameron Wagner—PhD student
2024 Seth Chew—PhD student
2024 Leah Huzjak—PhD student

Student Awards

Chengyi Luo, Boeing Quantum Creator's Prize (2024)
Matthew A. Norcia, IUPAP Early Career Scientist Award presented at ICAP 2024 (2024)
Julia R.K. Cline, DAMOP Topical Group on Precision Measurement and Fundamental Constants Outstanding Poster Award winner (2018)
Matthew A. Norcia, finalist for Deborah Jin Award for Outstanding Doctoral Thesis Research in Atomic, Molecular, or Optical Physics (2018)
Matthew A. Norcia, National Research Council Postdoctoral Research Fellowship (June 2017)
Matthew N. Winchester, Outstanding Graduate for Research (April 2017)
Matthew N. Winchester, Senior Thesis (April 2017)
Kevin C. Cox, ARL Distinguished Postdoctoral Fellowship (Aug. 2016)
Matthew N. Winchester, Goldwater Scholar (April 2016)
Matthew N. Winchester, Astronaut Scholarship (June 2016)
Julia R.K. Cline, NSF Graduate Research Fellowship (2016)
Matthew A. Norcia, JILA Scientific Achievement Award (Feb. 2016)
Kevin C. Cox, Outstanding Presentation Award for "17 dB of Spin Squeezing with QND Measurements", Boulder Laboratories Postdoctoral Poster Symposium, Boulder, CO (2015)
Kevin Cox, ICAP Best Poster "Synchronization in Superradiant Lasers," Washington D.C. (2014)
Matthew A. Norcia, Outstanding Presentation Award for "Reduced Back Action for

Improved Spin Squeezing", Boulder Laboratories Postdoctoral Poster Symposium, Boulder, CO (2014)
Justin G. Bohnet, NRC Postdoctoral Fellowship (2013)
Justin G. Bohnet, Outstanding Presentation Award for "A Steady-State Superradiant Raman Laser", Boulder Laboratories Postdoctoral Poster Symposium, Boulder, CO (2013)
Zilong Chen, Beverly Sears Graduate Student Research Grant (2012)
Kevin C. Cox, NDSEG Graduate Fellowship (2012)
Justin G. Bohnet, NSF Graduate Research Fellowship (2010)
Zilong Chen, A*STAR Graduate Research Felllowship (2008)

Outreach

CU Wizards Show, "The Physics of Superheroes and Villains!" (Feb. 2026)
Public Lecture, Frost Science Museum, Miami, FL (Dec. 2025)
Tara Performing High School Lab Tour and Demo show (Feb. 2024)
CU Wizards Show, "The Physics of Superheroes and Villains!" (Jan. 2020)
CU Undergraduate Visiting Weekend Lab Tours (April 2018)
Mesa Elementary science presentation 4th grade, 50 students (Oct. 2017)
CU Wizards Show, "The Physics of Superheroes and Villains!" (Jan. 2017)
Saturday Afternoon Physics talk and tours, "Quantum Fuzziness and Quantum Certainty" (April 2015)
Lab Tours IFCS-EFTF IEEE International Frequency Control Symposium & European Frequency and Time Forum (April 2015)
DAMOP 2013 High School Educators Presentation—Frontiers of AMO Physics, Quebec City, Quebec, CA (June 2013).
Science Fair Interviewer, Foothill Elementary School (2012)

Full Publication List

1. "Simulation of topological superconductors and their competing orders using photon-mediated interactions," A. Chu, J. Kwan, E. Y. Song, S. H. P. Chew, J. K. Thompson, and A. M. Rey, Dec. 19, 2025, *arXiv*: arXiv:2512.17889. doi: 10.48550/arXiv.2512.17889.

2. "Collective three-body interactions enable a robust quantum speedup," H. Zhang, A. Chu, C. Luo, C. Maruko, E. A. Bohr, J. K. Thompson, and A. M. Rey, Dec. 05, 2025, *arXiv*: arXiv:2512.06170. doi: 10.48550/arXiv.2512.06170.

3. "Realization of three- and four-body interactions between momentum states in a cavity," C. Luo, H. Zhang, C. Maruko, E. A. Bohr, A. Chu, A. M. Rey, and J. K. Thompson, *Science*, vol. 390, no. 6776, pp. 925–929, Nov. 2025, doi: 10.1126/science.adv0990.

4. "Solitons in Arbitrary Dimensions Stabilized by Photon-Mediated Interactions," H. Zhang, A. Chu, C. Luo, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 135, no. 17, p. 173402, Oct. 2025, doi: 10.1103/qrk6-phhk.

5. "A Chip-scale Atomic Beam Source for Non-classical Light," B. J. Larsen, H. Hensley, G. D. Martinez, Alexander Staron W. R. McGehee, J. Kitching, J. K. Thompson, under review *Science Adv.*, May 2025. arXiv2506.00199, doi: 10.48550/arXiv.2506.00199 .
6. "Lieb-Mattis states for robust entangled differential phase sensing," R. Kaubruegger, D. F. Padilla, A. Shankar, C. Hotter, S. R. Muleady, J. Bringewatt, Y. Baamara, E.Abbasgholinejad, A. V. Gorshkov, K. Mølmer, J. K. Thompson, A. M. Rey, under review *PRX arXiv*: arXiv:2506.10151. June 2025 doi: 10.48550/arXiv.2506.10151.
7. "A symmetry-protected topological optical lattice clock," T. Xu, A. Chu, K. Kim, J. K. Thompson, J. Ye, T. Esslinger, and A. M. Rey, *PRX Quantum* 6(3):030322 Aug. 2025, doi: https://doi.org/10.1103/h1nh-thg9
8. "Time-resolved pairing gap spectroscopy in a quantum simulator of fermionic superfluidity inside an optical cavity," D. J. Young, E. Y. Song, A. Chu, D. Barberena, Z. Niu, V. M. Schäfer, R. J. Lewis-Swan, A. M. Rey, and J. K. Thompson, *Phys. Rev. Lett.* 134, 183404, May 2025, doi: https://doi.org/10.1103/PhysRevLett.134.183404
9. "A Dissipation-Induced Superradiant Transition in a Strontium Cavity-QED System," Song, E. Y.; Barberena, D.; Young, D. J.; Chaparro, E.; Chu, A.; Agarwal, S.; Niu, Z.; Young, J. T.; Rey, A. M.; Thompson, J. K., *Sci. Adv.*, *11* (17), eadu5799, Apr. 2025, doi: https://doi.org/10.1126/sciadv.adu5799.
10. "Hamiltonian Engineering of Collective XYZ Spin Models in an Optical Cavity," Luo, C.; Zhang, H.; Chu, A.; Maruko, C.; Rey, A. M.; Thompson, J. K., *Nat. Phys.*, 1–8. Apr. 2025 https://doi.org/10.1038/s41567-025-02866-0.
11. "Continuous Recoil-Driven Lasing and Cavity Frequency Pinning with Laser-Cooled Atoms," Schäfer, V. M.; Niu, Z.; Cline, J. R. K.; Young, D. J.; Song, E. Y.; Ritsch, H.; Thompson, J. K., *Nat. Phys.*, 1–7, Apr. 2025, doi: https://doi.org/10.1038/s41567-025-02854-4.

12. “Many-Body Gap Protection against Motional Dephasing of an Optical Clock Transition,” Z. Niu, V. M. Schäfer, H. Zhang, C. Wagner, N. R. Taylor, D. J. Young, E. Y. Song, A. Chu, A. M. Rey, and J. K. Thompson, *Phys. Rev. Lett.*, vol. 134, no. 11, p. 113403, Mar. 2025, doi: 10.1103/PhysRevLett.134.113403.
13. “Engineering One Axis Twisting via a Dissipative Berry Phase Using Strong Symmetries,” J. T. Young, E. Chaparro, A. Piñeiro Orioli, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 134, no. 4, p. 040801, Jan. 2025, doi: 10.1103/PhysRevLett.134.040801.
14. “Continuous Collective Strong Coupling of Strontium Atoms to a High Finesse Ring Cavity,” J. R. K. Cline, V. M. Schäfer, Z. Niu, D. J. Young, T. H. Yoon, and J. K. Thompson, *Phys. Rev. Lett.*, vol. 134, no. 1, p. 013403, Jan. 2025, doi: 10.1103/PhysRevLett.134.013403.
15. “Entanglement Generation in Weakly Driven Arrays of Multilevel Atoms via Dipolar Interactions,” S. Agarwal, A. P. Orioli, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 133, no. 23, p. 233003, Dec. 2024, doi: 10.1103/PhysRevLett.133.233003.
16. “Entangled matter waves for quantum enhanced sensing,” J. D. Wilson, J. T. Reilly, H. Zhang, C. Luo, A. Chu, J. K. Thompson, A. M. Rey, and M. J. Holland, *Phys. Rev. A*, vol. 110, no. 4, p. L041301, Oct. 2024, doi: 10.1103/PhysRevA.110.L041301.
17. “Trade-offs between unitary and measurement induced spin squeezing in cavity QED,” D. Barberena, A. Chu, J. K. Thompson, and A. M. Rey, *Phys. Rev. Res.*, vol. 6, no. 3, p. L032037, Aug. 2024, doi: 10.1103/PhysRevResearch.6.L032037.
18. “Momentum-exchange interactions in a Bragg atom interferometer suppress Doppler dephasing,” C. Luo, H. Zhang, V. P. W. Koh, J. D. Wilson, A. Chu, M. J. Holland, A. M. Rey, and J. K. Thompson, *Science*, vol. 384, no. 6695, pp. 551–556, May 2024, doi: 10.1126/science.adi1393.
19. “Observing dynamical phases of BCS superconductors in a cavity QED simulator,” D. J. Young, A. Chu, E. Y. Song, D. Barberena, D. Wellnitz, Z. Niu, V. M. Schäfer, R. J. Lewis-Swan, A. M. Rey, and J. K. Thompson, *Nature*, vol. 625, no. 7996, pp. 679–684, Jan. 2024, doi: 10.1038/s41586-023-06911-x.
20. “Direct comparison of two spin-squeezed optical clock ensembles at the 10−17 level,” J. M. Robinson, M. Miklos, Y. M. Tso, C. J. Kennedy, T. Bothwell, D. Kedar, J. K. Thompson, and J. Ye, *Nat. Phys.*, vol. 20, no. 2, pp. 208–213, Jan. 2024, doi: 10.1038/s41567-023-02310-1.
21. “Control and amplification of Bloch oscillations via photon-mediated interactions,” H. Zhang, A. Chu, C. Luo, J. K. Thompson, and A. M. Rey, *Phys. Rev. Research*, vol. 5, no. 3, p. L032039, Sep. 2023, doi: 10.1103/PhysRevResearch.5.L032039.
22. “Ultra narrow linewidth frequency reference via measurement and feedback,” D. Barberena, R. J. Lewis-Swan, A. M. Rey, and J. K. Thompson, *C. R.. Phys.*, vol. 24, no. S3, pp. 1–14, Jun. 2023, doi: 10.5802/crphys.146.
23. “Photon-mediated correlated hopping in a synthetic ladder,” A. Chu, A. P. Orioli, D. Barberena, J. K. Thompson, and A. M. Rey, *Phys. Rev. Research*, vol. 5, no. 2, p. L022034, May 2023, doi: 10.1103/PhysRevResearch.5.L022034.

24. “Bosonic Pair Production and Squeezing for Optical Phase Measurements in Long-Lived Dipoles Coupled to a Cavity,” B. Sundar, D. Barberena, A. P. Orioli, A. Chu, J. K. Thompson, A. M. Rey, and R. J. Lewis-Swan, *Phys. Rev. Lett.*, vol. 130, no. 11, p. 113202, Mar. 2023, doi: 10.1103/PhysRevLett.130.113202.
25. “Opportunities and Limitations in Broadband Sensing,” A. M. Polloreno, J. L. Beckey, J. Levin, A. Shlosberg, J. K. Thompson, M. Foss-Feig, D. Hayes, and G. Smith, *Phys. Rev. Applied*, vol. 19, no. 1, p. 014029, Jan. 2023, doi: 10.1103/PhysRevApplied.19.014029.
26. “Resonant light enhances phase coherence in a cavity QED simulator of fermionic superfluidity,” S. P. Kelly, J. K. Thompson, A. M. Rey, and J. Marino, *Phys. Rev. Research*, vol. 4, no. 4, p. L042032, Nov. 2022, doi: 10.1103/PhysRevResearch.4.L042032.
27. “Entanglement-enhanced matter-wave interferometry in a high-finesse cavity,” G. P. Greve, C. Luo, B. Wu, and J. K. Thompson, *Nature*, vol. 610, no. 7932, pp. 472–477, Oct. 2022, doi: 10.1038/s41586-022-05197-9.
28. “Entropy transfer from a quantum particle to a classical coherent light field,” J. P. Bartolotta, S. B. Jäger, J. T. Reilly, M. A. Norcia, J. K. Thompson, G. Smith, and M. J. Holland, *Phys. Rev. Research*, vol. 4, no. 1, p. 013218, Mar. 2022, doi: 10.1103/PhysRevResearch.4.013218.
29. “Emergent Dark States from Superradiant Dynamics in Multilevel Atoms in a Cavity,” A. Piñeiro Orioli, J. K. Thompson, and A. M. Rey, *Phys. Rev. X*, vol. 12, no. 1, p. 011054, Mar. 2022, doi: 10.1103/PhysRevX.12.011054.
30. “Quantum Enhanced Cavity QED Interferometer with Partially Delocalized Atoms in Lattices,” A. Chu, P. He, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 127, no. 21, p. 210401, Nov. 2021, doi: 10.1103/PhysRevLett.127.210401.
31. “Cavity-QED measurements of the Sr 87 millihertz optical clock transition and determination of its natural linewidth,” J. A. Muniz, D. J. Young, J. R. K. Cline, and J. K. Thompson, *Phys. Rev. Research*, vol. 3, no. 2, p. 023152, May 2021, doi: 10.1103/PhysRevResearch.3.023152.
32. “Cavity-QED Quantum Simulator of Dynamical Phases of a Bardeen-Cooper-Schrieffer Superconductor,” R. J. Lewis-Swan, D. Barberena, J. R. K. Cline, D. J. Young, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 126, no. 17, p. 173601, Apr. 2021, doi: 10.1103/PhysRevLett.126.173601.
33. “Site-dependent selection of atoms for homogeneous atom-cavity coupling,” B. Wu, G. P. Greve, C. Luo, and J. K. Thompson, “Site-dependent selection of atoms for homogeneous atom-cavity coupling,” Apr. 02, 2021, *arXiv*: arXiv:2104.01201. http://arxiv.org/abs/2104.01201
34. “Atom-light entanglement for precise field sensing in the optical domain,” D. Barberena, R. J. Lewis-Swan, J. K. Thompson, and A. M. Rey, *Phys. Rev. A*, vol. 102, no. 5, p. 052615, Nov. 2020, doi: 10.1103/PhysRevA.102.052615.
35. “Facilitating spin squeezing generated by collective dynamics with single-particle decoherence,” K. Tucker, D. Barberena, R. J. Lewis-Swan, J. K. Thompson, J. G. Restrepo, and A. M. Rey, *Phys. Rev. A*, vol. 102, no. 5, p. 051701, Nov. 2020, doi: 10.1103/PhysRevA.102.051701.

36. “Protocol for Precise Field Sensing in the Optical Domain with Cold Atoms in a Cavity,” R. J. Lewis-Swan, D. Barberena, J. A. Muniz, J. R. K. Cline, D. Young, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 124, no. 19, p. 193602, May 2020, doi: 10.1103/PhysRevLett.124.193602.
37. “Exploring dynamical phase transitions with cold atoms in an optical cavity,” J. A. Muniz, D. Barberena, R. J. Lewis-Swan, D. J. Young, J. R. K. Cline, A. M. Rey, and J. K. Thompson, *Nature*, vol. 580, no. 7805, pp. 602–607, Apr. 2020, doi: 10.1038/s41586-020-2224-x.
38. “Laser cooling with adiabatic transfer on a Raman transition,” G. P. Greve, B. Wu, and J. K. Thompson, *New J. Phys.*, vol. 21, no. 7, p. 073045, Jul. 2019, doi: 10.1088/1367-2630/ab2f3c.
39. “Continuous Real-Time Tracking of a Quantum Phase Below the Standard Quantum Limit,” A. Shankar, G. P. Greve, B. Wu, J. K. Thompson, and M. Holland, *Phys. Rev. Lett.*, vol. 122, no. 23, p. 233602, Jun. 2019, doi: 10.1103/PhysRevLett.122.233602.
40. “Driven-dissipative quantum dynamics in ultra-long-lived dipoles in an optical cavity,” D. Barberena, R. J. Lewis-Swan, J. K. Thompson, and A. M. Rey, *Phys. Rev. A*, vol. 99, no. 5, p. 053411, May 2019, doi: 10.1103/PhysRevA.99.053411.
41. “An active optical frequency reference using a pulsed superradiant laser,” J. Muniz Silva, J. Cline, J. K. Thompson, and M. Norcia, “An active optical frequency reference using a pulsed superradiant laser,” in *Optical, Opto-Atomic, and Entanglement-Enhanced Precision Metrology*, San Francisco, United States: SPIE, Mar. 2019, p. 78. doi: 10.1117/12.2515582.
42. “Robust Spin Squeezing via Photon-Mediated Interactions on an Optical Clock Transition,” R. J. Lewis-Swan, M. A. Norcia, J. R. K. Cline, J. K. Thompson, and A. M. Rey, *Phys. Rev. Lett.*, vol. 121, no. 7, p. 070403, Aug. 2018, doi: 10.1103/PhysRevLett.121.070403.
43. “Laser cooling by sawtooth-wave adiabatic passage,” J. P. Bartolotta, M. A. Norcia, J. R. K. Cline, J. K. Thompson, and M. J. Holland, *Phys. Rev. A*, vol. 98, no. 2, p. 023404, Aug. 2018, doi: 10.1103/PhysRevA.98.023404.
44. “Cavity-mediated collective spin-exchange interactions in a strontium superradiant laser,” M. A. Norcia, R. J. Lewis-Swan, J. R. K. Cline, B. Zhu, A. M. Rey, and J. K. Thompson, *Science*, vol. 361, no. 6399, pp. 259–262, Jul. 2018, doi: 10.1126/science.aar3102.
45. “A Robust Narrow-Line Magneto-Optical Trap using Adiabatic Transfer,” J. A. Muniz, M. A. Norcia, J. R. K. Cline, and J. K. Thompson, “A Robust Narrow-Line Magneto-Optical Trap using Adiabatic Transfer,” Jun. 03, 2018, *arXiv*: arXiv:1806.00838. http://arxiv.org/abs/1806.00838
46. “Frequency Measurements of Superradiance from the Strontium Clock Transition,” M. A. Norcia, J. R. K. Cline, J. A. Muniz, J. M. Robinson, R. B. Hutson, A. Goban, G. E. Marti, J. Ye, and J. K. Thompson, *Phys. Rev. X*, vol. 8, no. 2, p. 021036, May 2018, doi: 10.1103/PhysRevX.8.021036.
47. “Narrow-line laser cooling by adiabatic transfer,” M. A. Norcia, J. R. K. Cline, J. P. Bartolotta, M. J. Holland, and J. K. Thompson, *New J. Phys.*, vol. 20, no. 2, p. 023021, Feb. 2018, doi: 10.1088/1367-2630/aaa950.

48. "Role of atoms in atomic gravitational-wave detectors," M. A. Norcia, J. R. K. Cline, and J. K. Thompson, *Phys. Rev. A*, vol. 96, no. 4, p. 042118, Oct. 2017, doi: 10.1103/PhysRevA.96.042118.
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Talks

1. "TBD," CoScaLi IX - Workshop on Collective Scattering of Light, Porquerolles, France (Sept. 2026)
2. "TBD," FOMO Frontiers of Matterwave Optics, Tuscany, Italy (Sept. 2026)
3. "TBD," Quantum Gases, Beijing, China (Aug. 2026)
4. "TBD," Fundamental Constants and Physics beyond the Standard Model, Hefei, China (June 2026)
5. "TBD," ICAP International Conference on Laser Spectroscopy, Wuhan, China (June 2026)
6. "TBD," Graduate Research Symposium, DAMOP, Providence, RI (June 2026)
7. "TBD," Univ. of Denver Physics Colloquium, Denver, CO (Apr 2026)
8. "TBD," APS March Meeting, Denver, CO (Mar 2026)
9. "Photon mediated interactions for quantum simulation and sensing," Informing Gravity Theory Through Quantum Simulation Experiments Workshop, Stanford Univ., Palo Alto, CA (Jan 2026)
10. "Superradiance, Berry Phases, and Dark Lasers in Strontium Cavity-QED Systems," SPIE Photonics West, San Francisco, CA (Jan 2026)
11. "Atoms Interacting via Photons," International Year of Quantum Science and Technology, Universidad de Los Andes, Bogotá, Colombia (Nov 2025)
12. "Cavity-mediated Interactions for Quantum Sensing and Simulation," Physics Colloquium, U. of Birmingham, Birmingham, England (Oct 2025)
13. "Quantum Metrology," 4 lectures Les Houches School on Quantum Metrology, Les Houches, France (Oct 2025)
14. "Crazy Cavity-mediated Interactions," Crazy Cavity Workship, Stanford University, Palo Alto, CA (Oct 2025)
15. "Cavity-mediated Interactions for Quantum Sensing and Simulation," Physics Frontier Center, JILA, Boulder, CO (Sep 2025)
16. "Cavity-mediated Interactions for Quantum Sensing and Simulation," International Conference on Emerging Quantum Technology, Hefei, China, via Zoom (Sep 2025)
17. "Cavity-mediated Interactions for Quantum Sensing and Simulation," BEC 2025, Sant Feliu de Guíxols, Spain (Sep 2025)
18. "Hot Atoms and Light Cooperating," DARPA, Arlington, VA (Aug 2025)
19. "Cavity-mediated Interactions for Quantum Sensing and Simulation," Physics Colloquium, U. of Colorado, Boulder, CO (Aug 2025)
20. "QND and Cavity-mediated Interactions for Quantum Sensing and Simulation," 2 lectures Johns Hopkins Summer School of Quantum Sensing and Precision Physics, Johns Hopkins University, Baltimore, MD (Aug 2025)

21. "Photon-mediated interactions for quantum sensing and simulation," DAMOP Hot Topic, Portland, OR (June 2025)
22. "Photon-mediated Interactions for Quantum Simulation and Sensing," Pittsburgh Quantum Institute (PQI) 2025, Pittsburgh, PA (Apr 2025)
23. "Emulating Dynamical Phases of BCS Superconductors using Cavity-QED," APS March Meeting, Anaheim, CA (Mar 2025), *presented by Dylan Young*
24. "Light-mediated interactions in a Bragg matterwave interferometer," Quantum Simulation with Engineered Dissipation, Obergurgl, Austria (Feb 2025)
25. "Light-mediated interactions in a Bragg matterwave interferometer," SPIE Photonics West, San Fransisco, CA (Jan 2025)
26. "Matter wave interferometry and Hamiltonian engineering in cavity QED," Physics of Quantum Electronics PQE, Snowbird, UT (Jan 2025)
27. "Quantum fuzziness and quantum certainty," Frost Science Museum, Public Lecture, hosted by Florida International University, Miami, FL (Dec 2024)
28. "Quantum simulation and sensing in cavity QED," Quantum Systems Accelerator, online (Nov 2024)
29. "Quantum simulation and sensing using light-mediated interactions," New Perspectives in Many-body Physics with Quantum Optical Systems, KITP Kavli Institute of Theoretical Physics, Univ. of California, Santa Barbara, CA (Oct 2024)
30. "Cavity-Mediated Interactions for Quantum Sensing and Simulation," Lectures Doctoral school on quantum technologies and quantum fluids, les Houches, Chamonix, France (Oct 2024)
31. "Quantum simulation and sensing using light-mediated interactions," National Academy of Sciences, Washington, DC (Oct 2024)
32. "Quantum simulation and sensing using light-mediated interactions," US-Japan Seminar on Quantum Electronics, Stanford Univ., Palo Alto, CA (Sep 2024)
33. "Quantum simulation and sensing using light-mediated interactions," Joint Quantum Institute Seminar JQI, U. Maryland, College Park, MD (Sep 2024)
34. "Hot Atoms and Light Cooperating," DARPA, Arlington, VA (Aug 2024)
35. "Controlling cavity-mediated interactions for quantum sensing and simulation," Challenges and perspectives in resonator-mediated many-body physics: From atoms to solid state, ETH, Zurich, Switzerland (June 2024)
36. "Observing dynamical phases of BCS superconductors in a cavity QED simulator," DAMOP, Fort Worth, TX (June 2024)
37. "Cavity-Mediated Interactions for Quantum Sensing and Simulation," Quantum Systems in Noronha, Fernando de Noronha, Brazil (Nov. 2023)
38. "Cavity-Mediated Interactions for Quantum Sensing and Simulation," International Symposium on Quantum Physics and Quantum Information Sciences, Beijing, China (Oct 2023)

39. "Hamiltonian Engineering in Matter wave Interferometers: QND, 1-Axis Twisting, 2-Axis Twisting, and Mossbauer-like Collective Recoil," Frontiers of Quantum Metrology: Fundamental Physics, Unexpected Connections, and Novel Applications, Kavli Institute for Theoretical Physics KITP, Santa Barbara, CA (Oct 2023)
40. "Cavity-Mediated Interactions for Quantum Metrology and Simulation," Gordon Research Conference on Atomic Physics, Newport, RI (June 2023)
41. "Collective Physics in Cavity-QED: Quantum Sensing and Quantum Simulation," National Academy of Science and Engineering Review, Boulder, CO (May 2023)
42. "Collective Physics in Cavity-QED: Dynamical Phases of BCS Superconductors," Ultra-Quantum Matter, Boulder, CO (May 2023)
43. "Squeezed Matterwave Interferometry & Momentum-Exchange Interactions," Lorentz Center, Leiden, Netherlands (April 2023)
44. "Exploring Collective Physics in Cavity-QED: Entanglement, Quantum Sensing, & Non-Equilibrium Many-body Simulations," Seminar, Hamburg, Germany (April 2023)
45. "Twisting and binding matter-waves: cavity-mediated momentum exchange," Q-SENSE Seminar, Boulder, CO (March 2023)
46. "Squeezing Enhanced Matter-wave Interferometry in a High Finesse Cavity," SPIE Photonics West, San Francisco, CA (Jan 2023)
47. "Entanglement Enhanced Matter-wave Interferometery in a High Finesse Cavity," PQE Physics of Quantum Electronics, Snowbird, UT (Jan 2023)
48. "Squeezed Inertial Sensing," Lockheed Review, Boulder, CO (Oct 2022)
49. "Infinite Range Interactions for Many-body Physics and Metrology," EMMI Workshop on Long Range Interactions International Conference on Atomic Physics, keynote talk, Innsbruck, Austria (Sept 2022)
50. "Cavity-QED for Quantum Sensing," Q-Sense Inaugural Summer School, Boulder, CO (Aug 2022)
51. "Entanglement-Enhanced Matter-Wave Interferometry in a High-Finesse Cavity," ICAP International Conference on Atomic Physics, invited talk, Toronto, Canada (July 2022)
52. "Entanglement for Quantum Sensing in Matter-wave Interferometers, Clocks, and Molecules," Q-SENSE Annual Meeting, Boulder, CO (June 2022)
53. "Entanglement-Enhanced Matter-Wave Interferometry in a High-Finesse Cavity," DAMOP Invited talk, Orlando, FL (June 2022)
54. "Experiments in Many-body Cavity QED: Entangled Matterwave Interferometers, Superradiant Lasers, and Dynamical Phase Transitions", Quantum Science Seminar Mainz, Virtual (Jan 2022)

    Video
55. "Experiments in Collective Cavity QED", Physics Frontier Center, JILA, Boulder, CO (Oct 2021)

56. “Twists, Gaps, Dynamical Phases, and Supperadiant Emission on Ultra-Narrow Optical Transitions,” COSCALI Collective Scattering of Light, Porqerolles, France (Sept 2021)
57. “Cavity QED systems: metrology with collective states,” Boulder School for Condensed Matter and Materials Physics: Ultracold Matter, Virtual (July 2021)

    Lecture 1, Lecture 2, Lecture 3
58. “Cavity-enhanced non-destructive measurements for determination of the strontium clock transition linewidth with 30 microhertz resolution,” SPIE Photonics West Optical and Quantum Sensing and Metrology (Mar 2021)

    Video
59. “Breaking Quantum and Thermal Limits with Collective Physics,” Physics Colloquium, ETH, Zurich, Switzerland (Dec 2020)
60. “Twists, Gaps, Dynamical Phases, and Supperadiant Emission on Ultra-Narrow Optical Transitions,” VAMOS Virtual AMO Seminar (July 2020)

    Video
61. “Spin Exchange Interactions and Dynamical Phase Transition in Strontium,” International Conference on Quantum Optics, Obergurgl, Austria (Feb 2020)
62. “Breaking Quantum and Thermal Limits with Collective Physics,” Colloquium Center for Fundamental Physics, Northwestern University, Chicago, IL (Nov 2019)
63. “Breaking Quantum and Thermal Limits with Collective Physics,” Physics Colloquium, Columbia University, New York, NY (Oct 2019)
64. “Breaking Quantum and Thermal Limits with Collective Physics,” Plenary Talk, LXII Congreso Nacional de Física, Villahermosa, Mexico, (Oct 2019)
65. “Breaking Quantum and Thermal Limits with Collective Physics,” Quantum Africa 5, Stellenbosch,_South Africa (Sept 2019)
66. “Collective Physics with Atoms and Light,” Quantum Metrology & Physics Beyond the Standard Model, JILA PFC, Boulder, CO (Aug 2019)
67. “Twists, gaps, and superradiant emission on a millihertz linewidth optical transition,” Quantum Metrology & Physics Beyond the Standard Model, Hannover, Germany (June 2019)
68. “Extreme Sensing,” ATN DARPA Review, Boulder, CO (May 2019)
69. “Quantum Sensing and Networks,” CUbit/Lockheed presentation, Boulder, CO (Apr. 2019)
70. “Superradiance on a milliHertz linewidth transition,” Dept. of Physics Colloquium, University of Michigan, An Arbor, MI (Feb. 2019)
71. “Superradiance on a milliHertz linewidth transition,” Dept. of Physics & Applied Physics Colloquium, Stanford University, Palo Alta, CA (Jan. 2019)
72. “Superradiance on a milliHertz linewidth transition,” European Trapped Ion Conference, Weizmann Institute, Rehovet, Israel (Nov. 2018)

73. “Cavity-mediated Spin-Exchange Interactions on the Strontium Clock Transition,” MIT/Harvard Center for Ultracold Atoms Seminar, Cambridge, MA (Nov. 2018)
74. “Cavity-mediated Spin-Exchange Interactions on the Strontium Clock Transition,” Quantum Optics IX, Cartagena de Indias, Columbia (Oct. 2018)
75. “Cavity-mediated Spin-Exchange Interactions on the Strontium Clock Transition,” Japan-US Seminar on Quantum Electronics and Laser Spectroscopy, Kanazawa, Japan (Sept. 2018)
76. “Cavity-mediated Spin-Exchange Interactions on the Strontium Clock Transition,” Gordon Research Conference on Quantum Science: Non-Equilibrium Quantum Matter and Scalable Quantum Computing, Stonehill College, Easton, MA (July 2018)
77. “A magneto-optical trap and laser cooling using adiabatic passage on a forbidden transition in strontium,” Physics of Quantum Electronics (PQE), Snowbird, UT (Jan. 2018)
78. “Collective Measurement for Creating Highly Squeezed Spin States of Rubidium,” Seminar, Dept. of Physics and Astronomy, Seoul National University, Seoul, Korea (Nov. 2017)
79. “Superradiance on a millihertz linewidth optical transition in laser-cooled strontium atoms,” Samsung Science and Technology Foundation Global Research Symposium on Coherent Quantum Control of Atom-Photon Interaction, Seoul, Korea (Oct. 2017)
80. “Quantum Many-body States for Precision Measurement,” Many-body Cavity QED ITAMP Workshop, Harvard Center for Astrophysics, Cambridge, MA (Oct. 2017)
81. “Breaking Quantum and Thermal Limits: things we can do with many atoms that we cannot do with one,” Visionary Speaker, Frontiers in Optics/Laser Science, Washington D.C. (Sept. 2017)
82. “Breaking Quantum and Thermal Limits: things we can do with many atoms that we cannot do with one,” Physical Measurement Laboratory Colloquium, NIST, Gaithersburg, MD (Sept. 2017)
83. “Extreme sensing using collective quantum physics,” DARPA Review, Boulder, CO (June 2017)
84. “Quantum many-body states for sensors,” General Dynamics Overview, Boulder, CO (April 2017)
85. “Extreme sensing using collective quantum physics,” JILA Physics Frontier Center, Boulder, CO (Feb. 2017)
86. “The first observation of superradiant emission on a millihertz linewidth optical transition in strontium,” SPIE Photonics West, San Fransisco, CA (Jan. 2017)
87. “Extreme Sensing,” DARPA Review, DARPA Arlington, VA (Dec. 2016)
88. “Breaking Quantum and Thermal Limits,” DARPA QUASAR, George Mason Univ., Arlington, VA (Sept. 2016)
89. “Clocks for Probing New Physics,” New Pathways for Physics Beyond the Standard Model Workshop, Univ. of California Berkeley, Berkeley, CA (June 2016)
90. “Breaking Quantum and Thermal Limits on Precision Measurements,” DAMOP 2016 Invited Talk in Cold Atoms in Optical Cavities session, Providence, RI (May 2016)

91. "Breaking Quantum and Thermal Limits," DARPA QUASAR, JILA, Boulder, CO (April 2016)
92. "Breaking Quantum and Thermal Limits on Precision Measurements," Quantum Optics 2016 Obergurgl, Austria (Feb 2016)
93. "Collective atom counting and first lasing on a millihertz linewidth optical transition," International Workshop on Ultracold Group II atoms, Paris Observatory, Paris, France (Feb 2016)
94. "Breaking Quantum and Thermal Limits," SPIE Photonics West, San Fransisco, CA (Feb 2016)
95. "Breaking Quantum and Thermal Limits," AMO Seminar, Stanford University, Palo Alto, CA (Nov. 2015)
96. "Quantum Accuracy and Quantum Fuzziness," Physics Colloquium, UCLA, Los Angeles, CA (Nov. 2015)
97. "Quantum Accuracy and Quantum Fuzziness," Physics Colloquium, Colorado School of Mines, Golden, CO (Nov. 2015)
98. "Breaking Quantum and Thermal Limits," DARPA QUASAR, UCSB, Santa Barbara, CA (Oct 2015)
99. "Overcoming Quantum and Thermal Limits for Precision Measurements," 12th US-Japan Seminar on many body quantum systems, Madison, WI (Sept. 2015)
100. "Breaking Quantum and Thermal Limits," Physics Research Opportunities Seminar, Boulder, CO (Sept. 2015)
101. "Quantum Many-Body States for Precision Measurement," NRC Review Panel, Boulder, CO (Sept. 2015)
102. "Quantum Fuzziness & <1 Photon Laser," REU Summer Program, Boulder, CO (July 2015)
103. "Collective Effects for Precision Measurement," University of Amsterdam, Amsterdam, Netherlands, (May 2015)
104. "Collective Effects for Precision Measurement," Niels Bohr Institute, Copenhagen, Denmark, (May 2015)
105. "Entanglement via Coherence Preserving Measurements," Continuous Variable Entanglement in Atomic Systems, WR Heraeus Seminar, Bad Honnef, Germany (May 2015)
106. "Quantum Fuzziness and Quantum Certainty," Saturday Morning Physics, Boulder, CO (April 2015)
107. "Enhancing Clocks with Collective Effects: Spin Squeezing and Superradiance," IFCS-EFTF IEEE International Frequency Control Symposium & European Frequency and Time Forum, Denver, CO (April 2015)
108. "Collective Effects for Precision Measurements," DARPA QUASAR, Boston, MA (March 2015)

109. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2015)
110. "Collective Effects for Precision Measurements," Physics Frontier Center, Boulder, CO (Feb. 2015)
111. "Quantum Fuzziness and Quantum Certainty," James Franck Institute 1st Tuesday Colloquium, Univ. of Chicago, Chicago, IL (Oct. 2014)
112. "Collective Effects for Enhancing Frequency Metrology," DARPA QUASAR, Broomfield, CO (Sept. 2014)
113. "Collective Effects for Enhancing Quantum Metrology," IMODS/NIST Workshop on Quantum Technologies, NIST, Boulder, CO (June 2014)
114. "Dynamics of a Superradiant Laser, " DAMOP Focus Session, Madison, WI (June 2014)
115. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2014)
116. "Collective Effects for Enhancing Frequency Metrology," DARPA QUASAR, Long Beach, CA (Jan. 2014)
117. "10 dB of Observed Squeezing via Collective Measurement," Physics of Quantum Electronics PQE, Snowbird, UT (Jan. 2014)
118. "Exploring Collective Effects for Precision Measurement," Physics Colloquium, Dept. of Physics, Univ. of Washington, Seattle, WA (Nov. 2013)
119. "Optical Coherence Times Approaching One Hour," NIST Colloquium, NIST, Gaithersburg, MD (Nov. 2013)
120. "Exploring Collective Effects for Precision Measurement," Joint Quantum Institute, Univ. of Maryland, College Park, MD (Oct. 2013)
121. "Breaking Quantum and Thermal Limits," CU Physics Research Opportunities Seminar, Boulder, CO (Sept. 2013)
122. "Superradiant Lasers for Advanced Communication," NIST Advanced Communication Workshop, NIST, Boulder, CO (Sept. 2013).
123. "Exploring Collective Effects for Precision Measurement," 6th International Symposium on Modern Problems of Laser Physics, Novosibirsk, RS (August, 2013)
124. "Exploring Collective Effects for Precision Measurement," Gordon Research Conference on Atomic Physics, Newport, RI (June, 2013)
125. "A Cold-Atom Laser with <1 Intracavity Photon," CLEO/QELS2013, San Jose, CA, (June, 2013).
126. "Exploring Collective Effects for Precision Measurement," AMO Seminar, Univ. of California, Berkeley, CA (May 2013)
127. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2013)

128. "Superradiant Lasers," DARPA QuASAR Workshop, JILA, Boulder, CO (March, 2013)
129. "Superradiant Laser with <1 Intracavity Photon," Physics Frontier Center Talk, JILA, Boulder, CO (November, 2012)
130. "Superradiant Laser with <1 Intracavity Photons," NIST on a Chip Workshop, Boulder, CO (November, 2012)
131. "Superradiant Laser with <1 Intracavity Photons," APS Four Corners Sectional Meeting, New Mexico Inst. of Mining and Technology, Socorro, NM (October, 2012)
132. "Ensemble Cavity-QED for Quantum Metrology," Dept. of Physics Colloquium, Colorado State University, Fort Collins, CO (October, 2012)
133. "A Cold-Atom Superradiant Laser with <1 Intracavity Photon," Frontiers in Optics, Rochester, NY (October, 2012)
134. "Spin Squeezing a Large Atomic Ensemble," Division of Laser Science, Rochester, NY (October, 2012)
135. "Superradiant laser with <1 Intracavity photon", Optical, Electronic, and Quantum Systems Seminar OEQS, U.C. Boulder, CO (September, 2012)
136. "Superradiant laser with <1 Intracavity photon", DARPA QuASAR, Santa Barbara, CA, (August, 2012)
137. "Superradiant laser with <1 Intracavity photon", Hot Topics Session, ICAP, Paris, France (July, 2012)
138. "Superradiant laser with <1 Intracavity photon", Hot Topics Session, DAMOP, Anaheim, CA (June, 2012)
139. "Ensemble Cavity-QED and Precision Metrology", NIST Ion Trapping Group, Boulder, CO (May, 2012)
140. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2012)
141. "Breaking Quantum and Thermal Limits", REU talk, Boulder, CO (July, 2012)
142. "Squeezed Atoms and a Superradiant Laser with <1 Photon", MIT/Harvard Center for Ultracold Atoms, Harvard University, Cambridge, MA (April, 2012)
143. "Ensemble Cavity-QED and Precision Metrology", Southwest Quantum Information and Technology (SQuInT), Albuquerque, NM (Feb, 2012)
144. "Conditional Spin Squeezing of a Large Ensemble via the Vacuum Rabi Splitting" Frontiers of Matterwave Optics, Obergurgl, Austria (2011)
145. "Squeezing Quantum Fuzziness" JILA Colloquium Boulder, CO (2011)
146. "Squeezing of a Large Atomic Ensemble" NIST Time and Frequency Division Seminar Boulder, CO (2011)
147. "Breaking Quantum and Thermal Limits", CU Graduate Student Seminar (2011)
148. "Squeezing a Large Atomic Ensemble" Quantum Based Measurements NIST Workshop Breckenridge, CO (2010)

149. "Beating Projection Noise" Colloquium, Physics Dept. U. of Nevada, Reno, NV (2010)
150. "Coherence Preserving Quantum Nondemolition Measurements" Quantum Assisted Sensing and Readout Workshop (2010)

151. "Fundamentals of Cavity-QED", Michigan Quantum Summer School (2010)
152. "Beating Quantum Projection Noise", Michigan Quantum Summer School (2010)
153. "Collective Interactions between Atoms and Light", Michigan Quantum Summer School (2010)
154. "Can We Make Precision Measurements More Precise?" DAMOP (2008)
155. "Efficient Coupling of Atoms and Light and World Record Single-Ion Mass Comparisons" Optical Science and Engineering Program, University of Colorado at Boulder (2006)
156. "Efficient Coupling of Atoms and Light" MIT-Harvard Center for Ultracold Atoms (2006)
157. "Efficient Coupling of Atoms and Light" Texas A&M University (2006)
158. "Efficient Coupling of Atoms and Light" University of California Berkeley (2006)
159. "Efficient Coupling of Atoms and Light" Stanford University (2006)
160. "Efficient Coupling of Atoms and Light" Georgia Institute of Technology (2006)
161. "Efficient Coupling of Atoms and Light" College of William and Mary (2006)
162. "Efficient Coupling of Atoms and Light" University of Delaware (2006)
163. "Spectrally-Bright Photon Pairs Generated using Atomic Ensembles" Photonics West 2006, San Jose, CA (2006)
164. "Efficient Coupling of Atoms and Light" JILA, Boulder, CO (2006)
165. "High Efficiency Conversion of Spin-Gratings into Photons." Control and Manipulation of Quantum Systems, Ascona, Switzerland (2005)
166. "Testing $E=mc^2$ with a Two-Ion Balance." New England Meeting of the American Association of Physics Teachers, Cambridge, MA (2005)
167. "A Two-Ion 'Balance': a precision experiment with many implications." Thesis Prize Session Talk, DAMOP 2004, Tuscon, AZ (2004)
168. "Towards a Triggerable Single-Mode Single-Photon Source", MIT-Harvard Center for Ultracold Atoms (2004)
169. "A Two-Ion Balance and Polarization Forces." NIST Gaithersburg, MD (2003)
170. "A Two-Ion Balance and Polarization Forces." NIST Boulder, CO (2003)
171. "A Two-Ion Balance and Polarization Forces.", JILA, Boulder, CO (2003)
172. "A Two-Ion Balance and Polarization Forces." Stanford University (2003)
173. "A Two-Ion Balance and Polarization Forces." California Institute of Technology (2003)
174. "Does $E = mc^2$? Mass Comparisons at 10 ppt", MIT-Harvard Center for Ultracold Atoms (2003)

175. “A Two-Ion Waltz.”, DAMOP 2003, Boulder, CO, (2003)

176. “Simultaneous Cyclotron Frequency Comparisons for Mass Spectrometry at

10 ppt (+ something unexpected!)” Trapped Charged Particles and Fundamental Interactions, Wildbad Kreuth, Germany, (2002)

177. “Progress Towards Mass Spectrometry at 10 ppt.” DAMOP 2002, Williamsburg, VA, (2002)

178. “Electronic Refrigeration and Precision Mass Spectrometry”, DAMOP 2001, London, Ontario, CA (2001)