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Boulder, CO 80309

James K. Thompson
Curriculum Vitae

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Present Position **JILA/NIST & Dept. of Physics, University of Colorado at Boulder**
Fellow and Associate Professor Adjoint (2013)
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, Research Laboratory of Electronics,
and Department of Physics, with Vladan Vuletic (2003-2006).

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

Florida State University, B.A., M.S. Tallahassee, FL
M.S. Physics, 1997, Laser spectroscopy of helium-like ions.
B.A. Physics, 1995, Summa Cum Laude, Honors in Liberal Studies, Honors in
Major Thesis: "Measurement of the $1s2s^1S_0 - 1s2p^3P_1$ Transition in N^{5+} by Fast
Beam Laser Resonance."

Awards 2013 Department of Commerce Bronze Medal;
2004 Doctoral Thesis Prize of the American Physical Society's Division of
Atomic, Molecular and Optical Physics;
Barry M. Goldwater Scholar in Mathematics, Science and Engineering;
Phi Beta Kappa Marion Jewell Hay Award for Academic Excellence; Florida
State University Senior, Junior and Sophomore of the Year Academic Awards;
National Merit Scholar.

Student Awards

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 Fellowship (2008)

Service

JILA Visiting Fellow Secretary 2014-2015

CU Honors Council 2013-2015

CU Physics Honors Committee 2013-2015

CU Physics Graduate Committee 2006-2013

Visiting Graduate Student AMO/CM/Bio/PER Overview Talks 2012, 2013

Coordinated Selection of Katharine Burr Blodgett Fellowship Recipients 2013

JILA Beautification Committee 2008 to present

JILA Visiting Fellow committee 2012 to present

Review Panel ESF's EuroQUASAR, NSF Physics at the Information Frontier

NSF Reviewer, 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, etc.

REU advisor summers 2014, 2012, 2009, 2008

Comprehensive Examination 2, 3 and thesis committee member

Undergraduate Honors Defense committee member

Teaching

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

Exam Committees

PhD Thesis Defense Committees

1. 9/14 Markus Baden/CQT Singapore/Barrett
2. 8/14 Michael Bishof/Ye
3. 7/14 Benjamin Bloom/Ye
4. 12/13 Justin Bohnet/Thompson
5. 6/13 Zilong Chen/Thompson
6. 4/13 Jennifer Harlow/Lehnert
7. 8/13 Ricardo Jimenez-Martinez/Kitching&Titular Advisor
8. 11/12 Kai Hudek/Anderson
9. 10/12 Michael Foss-Feig/Rey
10. 4/12 Brandon Peden/Holland
11. 2/11 Evan Ali Salim/Anderson
12. 5/10 David Hume/Wineland
13. 2/10 Manuel Castellanos Beltran/Lehnert
14. 11/08 Quentin Diot/Anderson/Cornell
15. 08 Andrew Ludlow/Ye

Comprehensive Exam III Committees

1. 4/08 David Hume/Wineland
2. 5/08 Quentin Diot/Anderson/Cornell
3. 9/08 Manuel Castellanos Beltran/ Lehnert

4. 12/08 Sebastian Blatt/Ye
5. 12/09 Evan Ali Salim/Anderson
6. 11/10 Nathan Lemke/Oates
7. 11/11 Jennifer Harlow/Lehnert
8. 12/11 Zilong Chen/Thompson
9. 1/12 Ricardo Jimenez/Kitching
10. 3/12 Michael Martin/Ye
11. 10/12 Hsiang-Sheng Ku/Lehnert
12. 10/12 Ryan Bowler/Thompson
13. 11/12 Matt Grau/Cornell
14. 11/12 Justin Bohnet/Thompson
15. 5/13 Ben Bloom/Ye
16. 11/13 Adam Kaufman/Regal
17. 11/12 Will Kindel/Lehnert
18. 2/14 Adam Sirois/Aumentado
19. 2/14 Yiheng Lin/Wineland
20. 9/14 Sara Campbell/Ye

Comprehensive Exam II Committees

1. 8/09 Zilong Chen/Thompson
2. 9/10 Justin Bohnet/Thompson
3. 4/11 Michael Gerrity/Murnane
4. 4/11 Ke Ke/Radzhivsky
5. 3/12 Joshua Weiner/Thompson
6. 4/12 Chien-Chung Lee/Schibli
7. 12/12 Kevin Cox/Thompson
8. 2/13 Shane Rightley/Uzdensky
9. 9/13 Sara Campbell/Ye
10. 2/14 Matt Siewny/Perkins

Undergraduate Honors Thesis Committee

1. 10/11 Ted Schomay/Barnes
2. 11/13 Matthew Clark/Kapteyn
3. 11/13 Daniel Poulson/Zimmerman
4. 4/14 Eric Miller/Dessau
5. 4/14 Joshua Karpel/Regal

Outreach

DAMOP 2013 High School Educators Presentation—Frontiers of AMO Physics, Quebec City, Quebec, CA (June 2013).

Science Fair Interviewer, Foothill Elementary School (2012)

Popular Press Coverage & Communication

Nature Photonics, cover (Sept. 2014)

<http://www.nature.com/nphoton/journal/v8/n9/covers/index.html>

Research Highlight, “Quantum Entanglement: coming soon to a precision measurement near you,” Julie Phillips and J.K. Thompson (2014)

Research Highlight, “The Entanglement Tango,” Julie Phillips and Michael Foss-Feig (2012)

Research Highlight, “The Heart of Darkness,” J.K. Thompson and Julie Phillips (2012)

Physics.aps.org “Snapshots from the March Meeting—No-Photon Lasers, Hyperbolic Metamaterials, and More” (2014) <http://physics.aps.org/articles/v7/27?referer=rss>

Science News, “Quantum Time Keeping” (2014)
<https://www.sciencenews.org/article/quantum-timekeeping>

Nature “Atomic Physics: An almost lightless laser” **484**, 43-44 (April 5, 2012)

Photonics Spectra “Superradiant laser holds bright promise”, pg 17-18, June 2012.

Ars Technica, “First superradiant lasers produce nearly no photons (and that’s expected)” (2012) <http://arstechnica.com/science/2012/04/building-lasers-with-nearly-no-photons/>

German Public Radio Deutschlandfunk “Optischer Quantensprung” (2012)
http://www.deutschlandfunk.de/optischer-quantensprung.676.de.html?dram:article_id=29307

Phys.org, “No-photon laser: Physicists demonstrate 'superradiant' laser design” (2012)
<http://phys.org/news/2012-04-physicists-superradiant-laser.html>

Physics World, “Superradiant' laser created for first time”
<http://physicsworld.com/cws/article/news/2012/apr/05/superradiant-laser-created-for-first-time>

Science Daily, “New way of lasing: A 'superradiant' laser” (2012)
<http://www.sciencedaily.com/releases/2012/04/120404133654.htm>

Laser Focus World, “JILA demonstrates new type of 'superradiant' laser” (2012)
<http://www.laserfocusworld.com/articles/2012/04/jila-demonstrates-new-type-of-superradiant-laser.html>

Photonics.com, “Nearly Lightless Laser Has Bright Future” (2012)
<http://www.photonics.com/Article.aspx?AID=50547>

CNET, *Optics.org*, *io9*, *R&D Magazine*, *The Engineer*, *Wissenschaft Aktuell*, *Inovação Tecnológica* (2012)

NIST Tech Beat “JILA Superradiant Laser is 'A New Way of Lasing'”, Laura Ost (2012)
<http://www.nist.gov/pml/div689/laser-041712.cfm>

Youtube, “NIST/JILA Physicist James Thompson Superradiant Laser” (2012)
<http://www.youtube.com/watch?v=nqK4yE5Uzco>

Research Highlight, “The Laser with Perfect Pitch,” Julie Phillips and J.K. Thompson (2012)

Research Highlight, “Sayonara Demolition Man”, Julie Phillips (2010)

Publications

(38) “Reducing Collective Quantum State Rotation Errors with Reversible Dephasing,” Kevin C. Cox, Matthew A. Norcia, Joshua M. Weiner, Justin G. Bohnet, James K. Thompson, arxiv:1407.4359 (June 2014)

(37) “Phase diagram for injection locking a superradiant laser,” Kevin C. Cox, Joshua M. Weiner, James K. Thompson, under review *Phys. Rev. A* 90, 053845 (June 2014)

(36) “Reduced spin measurement back-action for a phase sensitivity 10 times beyond the standard quantum limit,” Justin G. Bohnet, Kevin C. Cox, Matthew A. Norcia, Joshua M. Weiner, Zilong Chen, J. K. Thompson, Article in *Nature Photonics* **8**, 731-736 (Sept. 2014).

(35) “Cavity-Aided Nondemolition Measurements”, Zilong Chen, Justin G. Bohnet, Joshua M. Weiner, Kevin C. Cox, J.K. Thompson, *Phys. Rev. A* **89**, 043837 (April 2014)

(34) “Linear Response Theory for Superradiant Laser,” J.G. Bohnet, Z. Chen, J.M. Weiner, K.C. Cox, J.K. Thompson, *Phys. Rev. A* **89**, 013806 (January 2014)
Editor’s Suggestion

(33) “Quantum Synchronization of Two Ensembles of Atoms,” Minghui Xu, D. A. Tieri, E. C. Fine, J.K. Thompson, M.J. Holland, to be published *Phys. Rev. Lett.*, *arxiv*: 1307.5891 (2014)

(32) “Active and passive sensing of collective atomic coherence in a superradiant laser,” Justin G. Bohnet, Zilong Chen, Joshua M. Weiner, Kevin C. Cox, J. K. Thompson, *Phys. Rev. A* **88**, 013826 (July 2013)

(31) “A Quasi-Continuous Superradiant Raman Laser with <1 Intra-cavity Photon,” J. G. Bohnet, Z. Chen, J. M. Weiner, K. C. Cox, D. Meiser, M. J. Holland, J. K. Thompson, Proceedings of the 23rd International Conference on Atomic Physics, *EPJ Web of Conferences* **57**, 03003 (Aug. 2013).

(30) “Relaxation oscillations, stability, and cavity feedback in a superradiant Raman laser,” J. G. Bohnet et al, *Phys. Rev. Lett.* **109**, 253602 (2012).

(29) “Superradiant Raman laser magnetometer,” J. M. Weiner, K. C. Cox, J. G. Bohnet, Z. Chen, J.K. Thompson, *Appl. Phys. Lett.* **101**, 261107 (2012)

(28) “Steady-state many-body entanglement of hot reactive fermions,” M. Foss-Feig, A. J. Daley, J. K. Thompson, A. M. Rey, *Phys. Rev. Lett.* **109**, 230501 (2012)

(27) “General formalism for evaluating the impact of phase noise on Bloch vector rotations,” Z. Chen, J. G. Bohnet, J. M. Weiner, J. K. Thompson, *Phys. Rev. A* **86**, 032313 (2012)

(26) “A Steady State Superradiant Laser with <1 Intracavity Photon”, J. G. Bohnet, Z. Chen, J. M. Weiner, D. Meiser, M. J. Holland, J.K. Thompson, *Nature* **484** 78-81, April 5 (2012).

(25) “A Low Phase Noise Microwave Source for Atomic Spin Squeezing Experiments in ^{87}Rb ”, Z. Chen, J. G. Bohnet, J. M. Weiner, and J. K. Thompson, *Rev. Sci. Instr.* **83**, 044701 (2012).

- (24) “Conditional Spin Squeezing of a Large Ensemble via the Vacuum Rabi Splitting”, Z. Chen, J. G. Bohnet, S. R. Sankar, J. Dai, J.K. Thompson, *Phys. Rev. Lett.* **106**, 133601 (2011)
- (23) “Interfacing Collective Atomic Excitations and Single Photons.” J. Simon, H. Tanji, J.K. Thompson, V. Vuletic, *Physical Review Letters* **98**, 183601 (2007)
- (22) “External-Feedback Laser Cooling of Gases.”, V. Vuletic, A. T. Black, J.K. Thompson, J. Simon, *Physical Review A* **75**, 051405(R) (2007)
- (21) “Influence of grating parameters on the linewidths of external-cavity diode lasers.” H. Loh, Y. Lin, I. Teper, M. Cetina, J. Simon, J. K. Thompson, V. Vuletic. *Applied Optics* **45**, 9191 (2006)
- (20) “A high-brightness source of narrowband, identical-photon pairs.”, J.K. Thompson, J. Simon, H. Loh, V. Vuletic, *Science* **313** 74, (2006)
- (19) “On-demand superradiant conversion of atomic spin-gratings into single photons with high efficiency.” A. T. Black, J.K. Thompson, V. Vuletic, *Physical Review Letters* **95**, 133601, (2005)
- (18) “Atomic Samples in Resonators: Forces, Photons, Feedback.” J.K. Thompson, A.T. Black, V. Vuletic, *Proc. of the 19th Intern. Conf. on Atomic Physics*, Rio de Janeiro, Brazil, AIP press, (2005)
- (17) “Collective light forces on atoms in resonators.” A.T. Black, J.K. Thompson, V. Vuletic, *J. of Physics B*, **38**, S605, (2005)
- (16) “A direct test of $E=mc^2$.” S. Rainville, J.K. Thompson, *et al*, *Nature* **438** 1096, (2005)
- (15) “Ion Balance Mass Spectrometry.” J.K. Thompson, S. Rainville, D.E. Pritchard, *Proc. of the 19th Intern. Conf. on Atomic Physics*, Rio de Janeiro, Brazil, AIP press, (2005)
- (14) “Cyclotron frequency shift arising from polarization forces.” J.K. Thompson, S. Rainville, D.E. Pritchard, *Nature*, **430**, 58, (2004)
- (13) “An ion balance for ultra-high precision atomic mass measurements.” S. Rainville, J.K. Thompson, D.E. Pritchard, *Science*, **303**, 334, (2004)
- (12) “Penning trap measurements of the masses of ^{133}Cs , ^{87}Rb , ^{85}Rb , and ^{23}Na with uncertainties $\leq 0.2\text{ppb}$.” M.P. Bradley, J.V. Porto, S. Rainville, J.K. Thompson, D.E. Pritchard, *Physical Review Letters*, **83** 4510, (1999).
- (11) “Two ions in one trap: Ultra-high precision mass spectrometry?” S. Rainville, J.K. Thompson, D.E. Pritchard, *IEEE Transactions on Instrumentation and Measurement* **52** 292, (2003)

- (10) “Single-ion mass spectrometry at 100 ppt and beyond.” S. Rainville, J.K. Thompson, D.E. Pritchard, *Canadian Journal of Physics* **80** 1329, (2002).
- (9) “Precise measurements of the masses of Cs, Rb, and Na – A new route to the fine structure constant.” S. Rainville, M.P. Bradley, J.V. Porto, J.K. Thompson, D.E. Pritchard, *Hyperfine Interactions* **132** 177, (2001)
- (8) “Mass spectrometry at 100 parts per trillion.” D.E. Pritchard, J.K. Thompson, *Proc. on Trapped Particles & Fundamental Physics*, Kluwer Press, 2000.
- (7) “Single ion mass spectrometry and the fine structure constant.” D.E. Pritchard, M.P. Bradley, J.V. Porto, S. Rainville, J.K. Thompson, *Proceedings of 17th Intern. Conf. on Atomic Physics*, Florence, Italy, AIP Press, (2000).
- (6) “Lamb shift, fine structure constant and hyperfine structure in helium-like ions by fast-beam laser spectroscopy.” E.G. Myers, J.K. Thompson, H.S. Margolis, J.D. Silver, M.R. Tarbutt, *Hyperfine Interactions*, **127**, 323, (2000)
- (5) “Precision measurement of the $1s2p^3P_2 - ^3P_1$ fine structure interval in helium-like fluorine.” E.G. Myers, H.S. Margolis, J.K. Thompson, et al., *Physical Review Letters*, **82** 4200, 1999.
- (4) “Measurements of the $1s2s^1S_0 - 1s2p^3P_{1,0}$ transitions in helium-like nitrogen.” J.K. Thompson, D.J.H. Howie, E.G. Myers, *Physical Review A*, **57** 180, 1998.
- (3) “Hyperfine-induced $1s2s^1S_0 - 1s2p^3P_0$ transition and fine-structure measurement in helium-like nitrogen.” E.G. Myers, D.J.H. Howie, J.K. Thompson, D.J. Silver, *Physical Review Letters*, **76**, 4899, 1996.
- (2) “Operation of a radio-frequency ion source in a tandem electrostatic accelerator.” E.G. Myers, J.K. Thompson, et al., *Nuclear Instruments and Methods*, **372** 280, 1996.
- (1) “Measurement of the $1s2s^1S_0 - 1s2p^3P_1$ interval in helium-like nitrogen.” E.G. Myers, J.K. Thompson, et al., *Physical Review Letters*, **75** 3637, 1995.

Talks

1. “Superradiant Laser,” Physics of Quantum Electronics PQE, Snowbird, UT (Jan. 2014)
2. “Quantum Fuzziness and Quantum Certainty,” James Franck Institute 1st Tuesday Colloquium, Univ. of Chicago, Chicago, IL (Oct. 2014)
3. “Collective Effects for Enhancing Frequency Metrology,” DARPA QUASAR, Broomfield, CO (Sept. 2014)

4. "Collective Effects for Enhancing Quantum Metrology," IMODS/NIST Workshop on Quantum Technologies, NIST, Boulder, CO (June 2014)
5. "Dynamics of a Superradiant Laser," DAMOP Focus Session, Madison, WI (June 2014)
6. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2014)
7. "Collective Effects for Enhancing Frequency Metrology," DARPA QUASAR, Long Beach, CA (Jan. 2014)
8. "10 dB of Observed Squeezing via Collective Measurement," Physics of Quantum Electronics PQE, Snowbird, UT (Jan. 2014)
9. "Exploring Collective Effects for Precision Measurement," Physics Colloquium, Dept. of Physics, Univ. of Washington, Seattle, WA (Nov. 2013)
10. "Optical Coherence Times Approaching One Hour," NIST Colloquium, NIST, Gaithersburg, MD (Nov. 2013)
11. "Exploring Collective Effects for Precision Measurement," Joint Quantum Institute, Univ. of Maryland, College Park, MD (Oct. 2013)
12. "Breaking Quantum and Thermal Limits," CU Physics Research Opportunities Seminar, Boulder, CO (Sept. 2013)
13. "Superradiant Lasers for Advanced Communication," NIST Advanced Communication Workshop, NIST, Boulder, CO (Sept. 2013).
14. "Exploring Collective Effects for Precision Measurement," 6th International Symposium on Modern Problems of Laser Physics, Novosibirsk, RS (August, 2013)
15. "Exploring Collective Effects for Precision Measurement," Gordon Research Conference on Atomic Physics, Newport, RI (June, 2013)
16. "A Cold-Atom Laser with <1 Intracavity Photon," CLEO/QELS2013, San Jose, CA, (June, 2013).
17. "Exploring Collective Effects for Precision Measurement," AMO Seminar, Univ. of California, Berkeley, CA (May 2013)
18. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2013)

19. "Superradiant Lasers," DARPA QuASAR Workshop, JILA, Boulder, CO (March, 2013)
20. "Superradiant Laser with <1 Intracavity Photon," Physics Frontier Center Talk, JILA, Boulder, CO (November, 2012)
21. "Superradiant Laser with <1 Intracavity Photons," NIST on a Chip Workshop, Boulder, CO (November, 2012)
22. "Superradiant Laser with <1 Intracavity Photons," APS Four Corners Sectional Meeting, New Mexico Inst. of Mining and Technology, Socorro, NM (October, 2012)
23. "Ensemble Cavity-QED for Quantum Metrology," Dept. of Physics Colloquium, Colorado State University, Fort Collins, CO (October, 2012)
24. "A Cold-Atom Superradiant Laser with <1 Intracavity Photon," Frontiers in Optics, Rochester, NY (October, 2012)
25. "Spin Squeezing a Large Atomic Ensemble," Division of Laser Science, Rochester, NY (October, 2012)
26. "Superradiant laser with <1 Intracavity photon", Optical, Electronic, and Quantum Systems Seminar OEQS, U.C. Boulder, CO (September, 2012)
27. "Superradiant laser with <1 Intracavity photon", DARPA QuASAR, Santa Barbara, CA, (August, 2012)
28. "Superradiant laser with <1 Intracavity photon", Hot Topics Session, ICAP, Paris, France (July, 2012)
29. "Superradiant laser with <1 Intracavity photon", Hot Topics Session, DAMOP, Anaheim, CA (June, 2012)
30. "Ensemble Cavity-QED and Precision Metrology", NIST Ion Trapping Group, Boulder, CO (May, 2012)
31. "Table Top Physics in Boulder", graduate recruiting weekends, Boulder, CO (March and April 2012)
32. "Breaking Quantum and Thermal Limits", REU talk, Boulder, CO (July, 2012)
33. "Squeezed Atoms and a Superradiant Laser with <1 Photon", MIT/Harvard Center for Ultracold Atoms, Harvard University, Cambridge, MA (April, 2012)

34. "Ensemble Cavity-QED and Precision Metrology", Southwest Quantum Information and Technology (SQuInT), Albuquerque, NM (Feb, 2012)
35. "Conditional Spin Squeezing of a Large Ensemble via the Vacuum Rabi Splitting" Frontiers of Matterwave Optics, Obergurgl, Austria (2011)
36. "Squeezing Quantum Fuzziness" JILA Colloquium Boulder, CO (2011)
37. "Squeezing of a Large Atomic Ensemble" NIST Time and Frequency Division Seminar Boulder, CO (2011)
38. "Breaking Quantum and Thermal Limits", CU Graduate Student Seminar (2011)
39. "Squeezing a Large Atomic Ensemble" Quantum Based Measurements NIST Workshop Breckenridge, CO (2010)
40. "Beating Projection Noise" Colloquium, Physics Dept. U. of Nevada, Reno, NV (2010)
41. "Coherence Preserving Quantum Nondemolition Measurements" Quantum Assisted Sensing and Readout Workshop (2010)
42. "Fundamentals of Cavity-QED", Michigan Quantum Summer School (2010)
43. "Beating Quantum Projection Noise", Michigan Quantum Summer School (2010)
44. "Collective Interactions between Atoms and Light", Michigan Quantum Summer School (2010)
45. "Can We Make Precision Measurements More Precise?" DAMOP (2008)
46. "Efficient Coupling of Atoms and Light and World Record Single-Ion Mass Comparisons" Optical Science and Engineering Program, University of Colorado at Boulder (2006)
47. "Efficient Coupling of Atoms and Light" MIT-Harvard Center for Ultracold Atoms (2006)
48. "Efficient Coupling of Atoms and Light" Texas A&M University (2006)
49. "Efficient Coupling of Atoms and Light" University of California Berkeley (2006)
50. "Efficient Coupling of Atoms and Light" Stanford University (2006)
51. "Efficient Coupling of Atoms and Light" Georgia Institute of Technology (2006)

52. "Efficient Coupling of Atoms and Light" College of William and Mary (2006)
53. "Efficient Coupling of Atoms and Light" University of Delaware (2006)
54. "Spectrally-Bright Photon Pairs Generated using Atomic Ensembles" Photonics West 2006, San Jose, CA (2006)
55. "Efficient Coupling of Atoms and Light" JILA, Boulder, CO (2006)
56. "High Efficiency Conversion of Spin-Gratings into Photons." Control and Manipulation of Quantum Systems, Ascona, Switzerland (2005)
57. "Testing $E=mc^2$ with a Two-Ion Balance." New England Meeting of the American Association of Physics Teachers, Cambridge, MA (2005)
58. "A Two-Ion 'Balance': a precision experiment with many implications." Thesis Prize Session Talk, DAMOP 2004, Tuscon, AZ (2004)
59. "Towards a Triggerable Single-Mode Single-Photon Source", MIT-Harvard Center for Ultracold Atoms (2004)
60. "A Two-Ion Balance and Polarization Forces." NIST Gaithersburg, MD (2003)
61. "A Two-Ion Balance and Polarization Forces." NIST Boulder, CO (2003)
62. "A Two-Ion Balance and Polarization Forces.", JILA, Boulder, CO (2003)
63. "A Two-Ion Balance and Polarization Forces." Stanford University (2003)
64. "A Two-Ion Balance and Polarization Forces." California Institute of Technology (2003)
65. "Does $E = mc^2$? Mass Comparisons at 10 ppt", MIT-Harvard Center for Ultracold Atoms (2003)
66. "A Two-Ion Waltz.", DAMOP 2003, Boulder, CO, (2003)
67. "Simultaneous Cyclotron Frequency Comparisons for Mass Spectrometry at 10 ppt (+ something unexpected!)" Trapped Charged Particles and Fundamental Interactions, Wildbad Kreuth, Germany, (2002)
68. "Progress Towards Mass Spectrometry at 10 ppt." DAMOP 2002, Williamsburg, VA, (2002)

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

Posters

1. “Spin Squeezing of Large Ensembles for Quantum Metrology,” ICAP, Paris, France (July 2012)

Group Talks

1. “Spin Squeezed States,” M.A. Norcia, Lehnert Group, Boulder, CO (July 2014)
2. "Phase Synchronization between Superradiant Lasers," *J.M. Weiner*, K.C. Cox, M.A. Norcia, J.G. Bohnet, J.K. Thompson, APS DAMOP, Madison, WI (Jun. 2014)
3. “Atoms cooperating in an optical cavity: Superradiant lasing and spin squeezing,” J.G. Bohnet, NIST Ion Trap Group, Boulder, CO (May 2014)
4. “Dynamics of a “Nearly-Lightless” Laser: Synchronization in Superradiance,” *J.M. Weiner*, K. C. Cox, M. A. Norcia, J. G. Bohnet, J.K. Thompson, APS March Meeting, Denver, CO (March 2014)
5. “10 dB of Spin Squeezing via Measurement -- a Useful Entanglement Resource” *K.C. Cox*, J.G. Bohnet, M.A. Norcia, J.M. Weiner, J.K. Thompson, APS March Meeting, Denver, CO (March 2014)
6. “Collective effects for enhancing precision measurement,” J.G. Bohnet, Thesis Defense JILA/Univ. of Colorado, Boulder, CO (Dec. 2013)
7. “Collective effects for enhancing precision measurement,” J.G. Bohnet, IQOQI Institute for Quantum Optics and Quantum Information, University of Innsbruck, Innsbruck, Austria (Nov. 2013)
8. “Collective effects for enhancing precision measurement,” J.G. Bohnet, LMU Ludwig-Maximilians-Universität, Munich, Germany, (Nov. 2013)
9. “Collective effects for enhancing precision measurement,” J.G. Bohnet, ETH Eidgenössische Technische Hochschule, Zurich, Switzerland (Oct. 2013)
10. “Collective effects for enhancing precision measurement,” J.G. Bohnet, EPFL Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland (Oct. 2013)
11. “Conditional Spin Squeezing Through Cavity-Aided Measurement,” *M.A. Norcia*, J.G. Bohnet, K.C. Cox, J. M. Weiner, Z. Chen, J.K. Thompson, Four Corners Section APS, Denver, CO (Oct. 2013)
12. “The 87Rb Superradiant Laser: Applications of ‘Nearly Lightless’ Laser,” *K. C.*

- Cox, J.G. Bohnet, J. M. Weiner, Z. Chen, M. A. Norcia, J.K. Thompson, Four Corners Section APS, Denver, CO (Oct. 2013)
13. "Collective Effects for Enhancing Frequency Metrology," *J. G. Bohnet*, J. M. Weiner, K. C. Cox, M.A. Norcia, Z. Chen, J.K. Thompson, DARPA QUASAR, Santa Cruz, CA (Aug. 2013)
 14. "Conditional Spin Squeezing Through Cavity-Aided Measurements," *K. C. Cox*, J.G. Bohnet, J.M. Weiner, M. A. Norcia, Z. Chen, J.K. Thompson, DAMOP, Quebec City, Canada (June 2013)
 15. "Relaxation Oscillations and Stability of a superradiant Raman laser" *J. Bohnet*, Z. Chen, J. M. Weiner, K. Cox, J.K. Thompson, DAMOP Quebec, Canada (June 2013)
 16. "A superradiant Raman laser as an atomic sensor" *J. Bohnet*, Z. Chen, J. M. Weiner, K. Cox, J.K. Thompson, APS April Meeting, Denver, CO (Apr 2013)
 17. "Conditional Spin Squeezing via Quantum Non-demolition Measurements with an Optical Cycling Transition", *J. M. Weiner*, K. Cox, M. Norcia, J. Bohnet, Z. Chen, K. McAlpine, J. K. Thompson, APS April Meeting, Denver, CO (April 2013)
 18. "Exploring Collective Effects for Precision Measurement: Superradiant Lasing and Spin Squeezing" *J. Bohnet*, Z. Chen, J. M. Weiner, K. Cox, Matt Norcia, J.K. Thompson, APS April Meeting, Denver, CO (Apr 2013)
 19. "Collective effects for enhancing precision measurement: Superradiant lasers and spin squeezing" *J. Bohnet*, Z. Chen, J. M. Weiner, K. Cox, J.K. Thompson, Seminar, Stanford University, Palo Alto, CA (Apr. 2013)
 20. "Cavity-enhanced non-demolition measurements: Atom counting and Spin Squeezing", Z. Chen, Southwest Quantum Information and Technology (SQUINT) Meeting, Santa Barbara, CA, (Feb 2013)
 21. "Dynamic Control of a Superradiant Laser for a Hybrid Atomic Sensor", *J. Bohnet*, Z. Chen, J. M. Weiner, K. Cox, J.K. Thompson, Cornell/Jin Group Meeting, Boulder, CO (Oct, 2012).
 22. "Superradiant Raman laser with <1 intracavity photons", *Z. Chen*, Hot Topic QCMC: Quantum Communication, Measurement and Computing, Vienna, Austria (July 2012)
 23. "Dynamic control of a superradiant laser for a hybrid atomic sensor", J. Bohnet, DAMOP, Anaheim, CA (June 2012)

24. "A Steady State Superradiant Laser with <1 intracavity photon", *J. G. Bohnet*, Z. Chen, J. M. Weiner, D. Meiser, M. J. Holland, J.K. Thompson, Cornell/Jin Group Boulder, CO (Nov 2011).
25. "A Steady State Superradiant Laser with <1 intracavity photon", *J. G. Bohnet*, Z. Chen, J. M. Weiner, D. Meiser, M. J. Holland, J.K. Thompson, Ye Group Meeting, Boulder, CO (Sept 2011).
26. "Conditional Spin-Squeezing of a Large Ensemble via the Vacuum Rabi Splitting", *Z. Chen*, J. G. Bohnet, J. M. Weiner, S. R. Sankar, J. Dai, J.K. Thompson, DAMOP, Atlanta, GA (June 2011)
27. "Conditional Spin Squeezing in a Large Ensemble", *Z. Chen*, Center for Quantum Technologies Seminar, National University of Singapore, Singapore, (Dec 2010)
28. "Large Ensemble Entanglement: Coherence Preserving Quantum Nondemolition Measurements." ", *J. G. Bohnet*, Z. Chen, J. M. Weiner, S. R. Sankar, J. Dai, J.K. Thompson, Four Corners Meeting APS, Ogden, UT (Oct 2010).
29. "Squeezing Quantum Noise," *Z. Chen*, J. G. Bohnet, J. M. Weiner, S. R. Sankar, J. Dai, J.K. Thompson, Cornell/Jin Group, Boulder, CO (Nov 2010)

Group Posters

1. "10 dB Squeezing: A Useful Entanglement Resource," *J.M. Weiner*, K.C. Cox, M.A. Norcia, J.G. Bohnet, Z. Chen, J.K. Thompson, DARPA QuASAR, Broomfield, CO (Sep. 2014)
2. "Synchronization in Superradiant Lasers", *K.C. Cox*, J.M. Weiner, J.K. Thompson, DARPA QUASAR, Broomfield CO (Sept. 2014)
3. "10 dB Squeezing: A Useful Entanglement Resource", *K.C. Cox*, M.A. Norcia, J.M. Weiner, J.G. Bohnet, J.K. Thompson, ICAP, Washington D.C. (Aug. 2014)
4. "Synchronization in Superradiant Lasers", *K.C. Cox*, J.M. Weiner, J.K. Thompson, ICAP, Washington D.C. (Aug. 2014)
5. "10 dB of Spin Squeezing," *M.A. Norcia*, K.C. Cox, J.M. Weiner, J.G. Bohnet, Z. Chen, J.K. Thompson, Quantum Science Gordon Conference, Stonehill College, Easton, MA (July 2014)
6. "Superradiant Lasers," *M.A. Norcia*, K.C. Cox, J.M. Weiner, J.G. Bohnet, Z. Chen, J.K. Thompson, Quantum Science Gordon Conference, Stonehill College, Easton, MA (July 2014)
7. "Synchronization in Superradiant Lasers", *K.C. Cox*, J.M. Weiner, J.K. Thompson, Boulder Labs Poster Symposium, Boulder, CO (July 2014)

8. "Direct Observation of Highly Spin Squeezed States," *J.M. Weiner, K.C. Cox, M.A. Norcia, J.G. Bohnet, Z. Chen, J.K. Thompson*, NSF Physics Frontier Center Review, Boulder, CO (Apr. 2014)
9. "Collective Effects for Enhancing Precision Measurements," *J. G. Bohnet, J.M. Weiner, K.C. Cox, M.A. Norcia, Z. Chen, J.K. Thompson*, DARPA QUASAR, Santa Cruz, CA (Aug. 2013)
10. "A Steady-State Superradiant Raman Laser," *J.G. Bohnet, J. M. Weiner, K. C. Cox, Z. Chen, M.A. Norcia and J. K. Thompson*, Boulder Laboratories Postdoctoral Poster Symposium, NIST, Boulder, CO (July 2013)
11. "Conditional Spin Squeezing through a Cavity-Aided QND Measurement," *J. M. Weiner, J. G. Bohnet, K.C. Cox, M.A. Norcia, Z. Chen, J.K. Thompson*, Boulder DOC Labs Poster Session, NIST, Boulder, CO (July 2013)
12. "Direct Observation of Highly Spin Squeezed States," *M.A. Norcia, J.G. Bohnet, K.C. Cox, J.M. Weiner, Z. Chen, J.K. Thompson*, Gordon Research Conference on Atomic Physics, Newport, RI (June 2013)
13. "A Steady-State Superradiant Raman Laser," *J.G. Bohnet, J.M. Weiner, Z. Chen, K.C. Cox, M.A. Norcia, D. Meiser, M.J. Holland, J.K. Thompson*, Gordon Research Conference on Atomic Physics, Newport, RI (June 2013)
14. "Direct Observation of Highly Spin-Squeezed States", *J.M. Weiner*, Int. Conf. on Laser Spectroscopy (ICOLS), Berkeley, CA (June 2013)
15. "Generating Atomic Spin Squeezed States for Quantum Metrology", *Z. Chen*, Southwest Quantum Information and Technology (SQUINT) Meeting, Santa Barbara, CA, (Feb 2013)
16. "A 'Nearly-Lightless' Laser", *J. M. Weiner*, Southwest Quantum Information and Technology (SQUINT) Meeting, Santa Barbara, CA, (Feb 2013)
17. "Spin Squeezing of Large Ensembles for Quantum Metrology," *J. M. Weiner*, Gordon Research Conference on Quantum Science, Easton, MA (August 2012)
18. "A Nearly Lightless Laser," *K.C. Cox*, Gordon Research Conference on Quantum Science, Easton, MA (August 2012)
19. "Spin Squeezing of Large Ensembles for Quantum Metrology", *Z. Chen*, QCMC: Quantum Communication, Measurement and Computing, Vienna, Austria (July 2012)
20. "A Nearly-Lightless Laser", *J. Bohnet*, DAMOP, Anaheim, CA (June 2012)

21. "Toward a Steady-State Superradiant Light Source", *J. M. Weiner*, J. G. Bohnet, Z. Chen, J.K. Thompson, DAMOP, Atlanta, GA (June 2011)
22. "Spin Squeezing of a Large Ensemble for Quantum Metrology", *Z. Chen*, J. G. Bohnet, *J. M. Weiner*, S. R. Sankar, J. Dai, J.K. Thompson, Atomic Physics Gordon Res. Conf., West Dover, VT (June 2011)
23. "Steady-State Superradiance and a "No-Photon" Laser", J. G. Bohnet, Z. Chen, J. M. Weiner, J.K. Thompson, Atomic Physics Gordon Res. Conf., West Dover, VT (June 2011)
24. "Beyond Quantum and Thermal Limits with Collective Cavity QED", *J. G. Bohnet*, Z. Chen, J. M. Weiner, J.K. Thompson, Boulder Labs Postdoctoral Symposium, Boulder, CO (April 2011)
25. "QND Measurements in a Resonant Cavity-QED System", *Z. Chen*, *J. G. Bohnet*, J. Dai, J.K. Thompson, DAMOP Houston, TX (May 2010)
26. "Towards Spin Squeezing via Collective Quantum Non-Demolition Measurements", *Z. Chen*, J. Dai, J. Bohnet, J.K. Thompson, Atomic Physics Gordon Research Conference, Tilton, NH (June 2009)
27. "Towards Spin Squeezing via Collective Quantum Non-Demolition Measurements", *Z. Chen*, J. Dai, J. Bohnet, J.K. Thompson, Four Corners APS (June 2009)