

Eric A. Cornell

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Degrees

B.S., Physics, with honor and with distinction, Stanford University, 1985
Ph.D., Physics, Massachusetts Institute of Technology, 1990

Appointments

Fellow, JILA, NIST and University of Colorado at Boulder, 1994-present
Senior Scientist, National Institute of Standards and Technology, Boulder, 1992-present
Professor Adjoint, Physics Department, University of Colorado, Boulder, 1995-present
Assistant Professor Adjoint, Physics Department, University of Colorado, Boulder, 1992-1995
Post-Doctorate, Joint Institute for Laboratory Astrophysics, Boulder, 1990-1992
Summer Post-Doctorate, Rowland Institute, Cambridge, 1990
Research Assistant, MIT, 1985-1990
Teaching Fellow, Harvard Extension School, 1989
Research Assistant, Stanford University, 1982-1985

Honors and Awards

Fellow, American Academy of Arts & Sciences, 2005
Nobel Prize in Physics 2001
Nobel Prize Citation: "for the achievement of Bose-Einstein condensation in dilute gases of alkali atoms, and for early fundamental studies of the properties of the condensates"
Member, National Academy of Sciences, 2000
Fellow, Optical Society of America, Elected 2000
R. W. Wood Prize, Optical Society of America, 1999
Benjamin Franklin Medal in Physics, 1999
Lorentz Medal, Royal Netherlands Academy of Arts and Sciences, 1998
Fellow, The American Physical Society, Elected 1997

I. I. Rabi Prize in Atomic, Molecular and Optical Physics, American Physical Society, 1997
King Faisal International Prize in Science, 1997
National Science Foundation Alan T. Waterman Award, 1997
Carl Zeiss Award, Ernst Abbe Fund, 1996
Fritz London Prize in Low Temperature Physics, 1996
Department of Commerce Gold Medal, 1996
Presidential Early Career Award in Science and Engineering, 1996
Newcomb-Cleveland Prize, American Association for the Advancement of Science, 1995-96
Samuel Wesley Stratton Award, National Institute of Science and Technology, 1995
Firestone Award for Excellence in Undergraduate Research, 1985
National Science Foundation Graduate Fellowship, 1985-1988

Eric A. Cornell

Publications

1. J. M. Lockhart, B. Cabrera, E. Cornell and S. J. Pollock, "Scanning 3-axis SQUID magnetometer for measurement of submicrogauss magnetic fields," in Proceedings of the 17th International Conference on Low Temperature Physics, (U. Eckern, A. Schmid, W. Weber, and H. Wuhl, Eds., Elsevier, 1984).
2. E. A. Cornell, "Ultra-low vapor pressure measurements on surface absorbed helium-4," Senior Thesis, Stanford University (unpublished, 1985).
3. J. P. Turneure, E. A. Cornell, P. D. Levine and J. A. Lipa, "The Stanford relativity gyroscope experiment: Ultrahigh vacuum techniques for the experiment," in Near Zero, (J. D. Fairbank et al., Eds., Freeman, New York, 1988).
4. R. M. Weisskoff, G. P. Lafyatis, K. R. Boyce, E. A. Cornell, R. W. Flanagan, Jr. and D. E. Pritchard, "rf SQUID detector for single-ion trapping experiments," *J. Appl. Phys.* **63**, 4599 (1988).
5. E. A. Cornell, R. M. Weisskoff, K. R. Boyce, R. W. Flanagan, Jr., G. P. Lafyatis and D. E. Pritchard, "A single ion cyclotron resonance measurement of $M(\text{CO}^+)/M(\text{N}_2^+)$," *Phys. Rev. Lett.* **63**, 1674 (1989) and **64**, 2099 (1990).
6. E. A. Cornell, R. M. Weisskoff, K. R. Boyce and D. E. Pritchard, "Mode coupling in a Penning trap: π -pulses and a classical avoided crossing," *Phys. Rev. A* **41**, 312 (1990).
7. E. A. Cornell, C. Monroe and C. E. Wieman, "Multiply-loaded ac magnetic trap for neutral atoms," *Phys. Rev. Lett.* **67**, 2439 (1991).
8. E. A. Cornell, K. R. Boyce, D. L. K. Fyngenson and D. E. Pritchard, "Two ions in a Penning trap: Implications for precision mass spectroscopy," *Phys. Rev. A* **45**, 3049 (1992).
9. C. E. Wieman, C. R. Monroe, and E. A. Cornell, "Fundamental physics with optically trapped atoms," in Laser Spectroscopy X, (M. Ducloy et al., Eds., World Scientific, 1992), pp. 77-82.
10. C. Monroe, E. Cornell, C. Sackett, C. Myatt and C. Wieman, "Measurement of Cs-Cs elastic scattering at $T=30 \mu\text{K}$," *Phys. Rev. Lett.* **70**, 414 (1993).

11. C. R. Monroe, E. A. Cornell and C. E. Wieman, "The low (temperature) road to Bose-Einstein condensation in optically and magnetically trapped cesium," in Proceedings of the International School of Physics "Enrico Fermi" Course CXVIII, Laser Manipulation of Atoms and Ions, (E. Arimondo, W. D. Phillips and F. Strumia, Eds., North Holland, 1992), pp. 361-377.
12. C. Sackett, E. Cornell, C. Monroe and C. Wieman, "A new magnetic suspension system for atoms and bar magnets," *Am. J. Phys.* 61, 304 (1993).
13. W. Petrich, M. H. Anderson, J. R. Ensher and E. A. Cornell, "Behavior of atoms in a compressed magneto-optical trap," *J. Opt. Soc. Am. B* 11, 1332 (1994).
14. M. H. Anderson, W. Petrich, J. R. Ensher and E. A. Cornell, "Reduction of light-assisted collisional loss rate from a low-pressure vapor-cell trap," *Phys. Rev. A* 50, R3597 (1994).
15. N. R. Newbury, C. J. Myatt, E. A. Cornell and C. E. Wieman, "Gravitational Sisyphus cooling of ^{87}Rb in a magnetic trap," *Phys. Rev. Lett.* 74, 2196 (1995).
16. W. Petrich, M. H. Anderson, J. R. Ensher and E. A. Cornell, "A stable, tightly confining magnetic trap for evaporative cooling of neutral atoms," *Phys. Rev. Lett.* 74, 3352 (1995).
17. E. A. Cornell, "Comment on 'A dynamic electric trap for ground-state atoms'," *Europhys. Lett.* 30, 439 (1995).
18. M. H. Anderson, J. R. Ensher, M. R. Matthews, C. E. Wieman and E. A. Cornell, "Observation of Bose-Einstein condensation in a dilute atomic vapor," *Science* 269, 198 (1995).
19. M. J. Renn, O. Vdovin, D. Z. Anderson, C. E. Wieman and E. A. Cornell, "Laser-guided atoms in hollow-core optical fibers," *Phys. Rev. Lett.* 75, 3253 (1995).
20. M. J. Renn, E. A. Donley, E. A. Cornell, C. E. Wieman and D. Z. Anderson, "Evanescent-wave guiding of atoms in hollow optical fibers," *Phys. Rev. A* 53, R648 (1996).
21. E. Cornell and C. Wieman, "Bose-Einstein Condensation," Physics News in 1995, (P. F. Schewe, Ed., American Institute of Physics, 1996), pp. 10-12.

22. M. H. Anderson, J. R. Ensher, M. R. Matthews, C. E. Wieman and E. A. Cornell, "Evidence for Bose-Einstein condensation in a dilute atomic vapor," Proc. of the 12th Intl. Conf. on Laser Spectroscopy (M. Inguscio, M. Allegrini and A. Sasso, Eds., World Scientific, Singapore, 1996), pp. 3-6.
23. D. S. Jin, J. R. Ensher, M. R. Matthews, C. E. Wieman and E. A. Cornell, "Collective excitations of a Bose-Einstein condensate in a dilute gas," *Phys. Rev. Lett.* 77, 420-423 (1996).
24. E. Cornell, "Very cold indeed: The nanokelvin physics of Bose-Einstein condensation," *J. Res. NIST* 101, 419-434 (1996).
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32. E. A. Burt, R. W. Ghrist, C. J. Myatt, M. J. Holland, E. A. Cornell and C. E. Wieman, "Coherence, correlations, and collisions: What one learns about Bose-Einstein condensates from their decay," *Phys. Rev. Lett.* 79, 337-340 (1997).
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37. F. S. Cataliotti, E. A. Cornell, C. Fort, M. Inguscio, F. Marin, M. Prevedelli and G. M. Tino, "Magneto-optical trapping of Fermionic potassium atoms," *Phys. Rev. A* 57, 1136-1138 (1998).
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39. D. S. Hall, M. R. Matthews, J. R. Ensher, C. E. Wieman and E. A. Cornell, "Dynamics of component separation in a binary mixture of Bose-Einstein condensates," *Phys. Rev. Lett.* 81, 1539-1542 (1998).
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41. M. R. Matthews, D. S. Hall, D. S. Jin, J. R. Ensher, C. E. Wieman, E. A. Cornell, (F. Dalfovo, C. Minniti and S. Stringari), "Dynamical response of a Bose-Einstein

- condensate to a discontinuous change in internal state,” Phys. Rev. Lett. 81, 243-247 (1998).
42. T. H. Gfroerer and E. A. Cornell, “Efficient directional spontaneous emission from an InGaAs/InP heterostructure with an integral parabolic reflector,” Appl. Phys. Lett. 84, 5360-5362 (1998).
 43. T. H. Gfroerer and E. A. Cornell, “Progress towards laser cooling in semiconductors,” in Radiative Processes and Dephasing in Semiconductors, Proceedings OSA TOPS, Vol. 18 (D. S. Citrin, Ed., OSA, 1998) pp. 39-41.
 44. E. A. Cornell, D. S. Hall, M. R. Matthews and C. E. Wieman, “Having it both ways: Distinguishable yet phase-coherent mixtures of Bose-Einstein condensates,” J. Low Temp. Phys. 113, 151-165 (1998).
 45. J. Williams, R. Walser, J. Cooper, E. Cornell and M. Holland, “Nonlinear Josephson-type oscillations of a driven, two-component Bose-Einstein condensate,” Phys. Rev. A. 59, R31-34 (1999).
 46. J. L. Roberts, N. R. Claussen, J. P. Burke, Jr., C. H. Greene, E. A. Cornell and C. E. Wieman, “Resonant magnetic field control of elastic scattering in cold ^{85}Rb ,” Phys. Rev. Lett. 81, 5109-5112 (1998).
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 48. C. E. Wieman, E. A. Cornell, D. Jin, J. Ensher, M. Matthews, C. Myatt, E. Burt and R. Ghrist, “The creation and study of Bose-Einstein condensation in a cold alkali vapor,” in Proceedings, Fifteenth International Conference on Atomic Physics: Zeeman-Effect Centenary (in press).
 49. C. E. Wieman and E. A. Cornell, “Bose-Einstein condensation in a cold vapor,” The 1997 King Faisal International Prize, King Faisal Award Proceedings (King Faisal Foundation, Riyadh, Saudi Arabia, 1998) pp. 86-93.
 50. D. S. Hall, M. R. Matthews, C. E. Wieman and E. A. Cornell, “Measurements of relative phase and quantum beat note between Bose-Einstein condensates,” in Proceedings, International Symposium on Foundations of Quantum Mechanics (in press).

51. F. S. Cataliotti, E. A. Cornell, C. Fort, M. Inguscio, M. Prevedelli and G. M. Tino, "Towards quantum degeneracy of bosonic and fermionic potassium atoms," in *Quantum Coherence and Decoherence, ISQM-Tokyo '98* (T. A. Ono and K. Fujikawa, Eds., Elsevier, 1999), pp. 123-128.
52. E. A. Cornell, J. R. Ensher and C. E. Wieman, "Experiments in dilute atomic Bose-Einstein condensation," in *Proceedings, International School of Physics 'Enrico Fermi' (Societa' Italiana Physica, 1999)*, pp. 15-66.
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63. E. A. Cornell, "Stopping light in its tracks," *Nature* 409, 461-462 (2001).
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65. P. C. Haljan, B. P. Anderson, I. R. Coddington and E. A. Cornell, "Use of surface-wave spectroscopy to characterize tilt modes of a vortex in a Bose-Einstein condensate," *Phys. Rev. Lett.* 86, 2922-2925 (2001).
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91. P. D. D. Schwindt, E. A. Cornell, T. Kishimoto, Y.-J. Wang and D. Z. Anderson, "Efficient loading of a magnetic waveguide on an atom chip," *Phys. Rev. A* 72, 023612/1-8 (2005).
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99. V. Schweikhard, S. Tung and E. A. Cornell, "Vortex proliferation in the Berezinskii-Kosterlitz-Thouless regime on a two-dimensional lattice of Bose-Einstein condensates," *Phys. Rev. Lett.* 99, 030401/1-4 (2007).
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of Bose-Einstein condensates,” in Proceedings, 2007 International Conference on Laser Spectroscopy (ICOLS).

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103. J. M. Pino, R. J. Wild, S. Ronen, D. S. Jin and E. A. Cornell, “When is a quantum gas a quantum liquid?” in Proceedings, International Conference on Atomic Physics (ICAP 2008).
104. E.R. Meyer, A. Leanhardt, E. Cornell and J.L. Bohn, “Berry-like phases in structured atoms and molecules”, *Phys. Rev. A* 80, 062110/1-13 (2009).
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Patents

Michelle S. E. Stephens, Peter A. Roos, Carl E. Wieman and Eric A. Cornell,
“Laser sensor using optical feedback-induced frequency modulation,”
U. S. Patent No. 5,808,743; September 15, 1998.

Eric A. Cornell and Michael J. Renn, “Optical Cooling of Solids,”
U. S. Patent No. 5,615,558; April 1, 1997.

Selected Presentations:

“A single ion cyclotron resonance measurement of $M(\text{CO}^+)/M(\text{N}_2^+)$,” poster, the Atomic Physics Gordon Conference (1989).

“Single ion mass spectroscopy,” University of Connecticut, Storrs (Autumn, 1990).

“Mass spectroscopy beyond a part per billion,” National Institute of Standards and Technology, Gaithersburg (Autumn, 1990).

“A single ion cyclotron resonance measurement of $M(\text{CO}^+)/M(\text{N}_2^+)$,” invited talk, American Physical Society Meeting, Anaheim (March, 1990).

“Mass spectroscopy beyond a part per billion,” National Institute of Standards and Technology, Boulder (March, 1990).

“Mass spectroscopy beyond a part per billion,” Lawrence Livermore National Labs, Livermore (May, 1990).

“Getting to Bose-Einstein condensation in a cesium vapor,” University of Virginia, Charlottesville (Spring, 1991).

“An oscillating-gradient magnetic trap for strong-field-seeking neutral atoms,” post-deadline talk, 1991 QELS Meeting, Baltimore (Summer, 1991).

“Magnetic traps, multiple loading schemes, and Bose condensation,” Joint Institute for Laboratory Astrophysics, Boulder (Summer, 1991).

“Cesium atoms below a microkelvin: New techniques and new results,” invited talk, 1991 ILS Meeting, Monterey (September, 1991).

“Atom trapping tricks: New routes to Bose-Einstein condensation in a vapor,” departmental colloquium, University of Virginia, Charlottesville (November, 1991).

“Getting to Bose condensation in an atom trap,” departmental colloquium, University of California, Berkeley (December, 1991).

“An experimental route to Bose condensation,” joint departmental colloquium and JILA seminar, University of Colorado, Boulder (January, 1992).

Eric A. Cornell

Selected Presentations (continued)

“Getting to Bose condensation in an atom trap,” departmental colloquium, Haverford College, Haverford (February, 1992).

“Getting to Bose condensation in an atom trap,” Modern Optics Seminar, Massachusetts Institute of Technology, Cambridge (February, 1992).

“Magnetically trapped atoms, cold collisions, and Bose condensation,” departmental colloquium, Colorado State University, Fort Collins (September, 1992).

“Atom traps, nanoelectronvolt collisions, and Bose condensation,” invited talk, University of Chicago, Chicago (March, 1993).

“Prospects for Bose condensations in heavy alkalis,” invited talk, American Physical Society, Division of Atomic, Molecular, and Optical Physics, Reno (May, 1993).

“Beyond the atom: Can we optically cool molecules, crystals, and beer?” Atomic Physics Seminar, NIST, Gaithersburg (June, 1993).

“Topics in Bose condensation and light,” invited talk at the workshop on New Theoretical Methods in Quantum Optics, University of Colorado, Boulder (July, 1993).

“Prospects for Bose condensation of magnetically trapped atoms,” invited talk, OSA Annual Meeting, Toronto (October, 1993).

“Collision experiments for today and BEC experiments for tomorrow,” invited talk, Workshop on Quantum Field Theory of Cold Atoms, Boulder (July, 1994).

“Laser cooling and trapping of atoms,” NIST Boulder Labs Colloquium, Boulder (October, 1994).

“What to do when 1 microkelvin isn't cold enough?” Solid State Seminar, Brown University, Providence (November, 1994).

“Colder, Denser, Ho!” ITAMP Seminar, Center for Astrophysics, Cambridge (November, 1994).

“Developments in cooling and manipulating atoms and more complicated objects,” invited talk, American Chemical Society Meeting, Anaheim (April, 1995).

Eric A. Cornell

Selected Presentations (continued)

“Evaporative and cyclic cooling: Colder magnetically trapped atoms at JILA,” invited talk, American Physical Society DAMOP meeting, Toronto, Canada (May, 1995).

“Evidence for Bose Einstein condensation in Rb-87,” invited talk, Twelfth International Conference on Laser Spectroscopy, Capri, Italy (June, 1995).

“Observation of BEC in Rb-87,” invited talk, BEC-II, Strasbourg, France (June, 1995).

“Bose–Einstein condensation in Rb-87,” invited talk, Gordon Conference (July, 1995).

“Weird quantum gas: Einstein comes to Boulder,” Gamow Memorial Lecture, Boulder (November, 1995).

“Very cold indeed: The nanokelvin physics of Bose–Einstein condensation,” NIST colloquium, Gaithersberg (February, 1996).

“Bose–Einstein condensation in a dilute vapor” given as a departmental colloquium at Aspen Center for Physics, University of Colorado, MIT, U. Connecticut, Colorado State University, U.C. Berkeley, Stanford, Illinois, Harvey Mudd, U.C. Riverside, Caltech, U.C. Irvine, SLAC, Univ. of Maryland, Univ. of Virginia, and Univ. of New Mexico, Max Planck Institut für Quantenoptik, LENS, Ecole Normale Supérieure (academic year 1995-1996).

“Bose-Einstein condensation,” Manne Siegbahn Lecture, Stockholm, Sweden (March, 1996).

“Bose-Einstein condensation,” invited talk, D.P.G. meeting, Rostock, Germany (March, 1996).

“BEC measurements,” invited talk, Workshop on Collective Effects in Ultracold Gases, Les Houches, France (April, 1996).

“Quantum physics at milli, micro, and nanokelvin,” invited talk, plenary session, IQEC, Sydney (July, 1996).

“Atom optics, fiber optics: Guiding rubidium through hollow glass fibers,” invited talk, Atom Optics Workshop, Cairns, Australia (July, 1996).

“BEC measurements at JILA,” invited talk, U.S. BEC Workshop, Boulder (July, 1996).

Eric A. Cornell

Selected Presentations (continued)

“Bose-Einstein condensation,” department colloquium, Amherst College, Amherst (October, 1996).

“Bose-Einstein condensation,” department colloquium, Wesleyan University, Middletown (October, 1996).

“Bose-Einstein condensation,” invited talk, Optical Society of America Annual Meeting, Rochester (October, 1996).

“Bose-Einstein condensation,” invited talk, National Academy of Science Frontiers of Science Series, University of California, Irvine (November, 1996).

“Bose-Einstein condensation,” invited talk, Condensed Matter Theory Workshop, Pune, India (December, 1996).

“Bose-Einstein condensation,” AMO seminar, University of California, Berkeley (February, 1997).

“Bose-Einstein condensation,” department colloquium, Stanford University, Palo Alto (February, 1997).

“Bose-Einstein condensation in trapped atomic Rb,” invited talk, The American Physical Society, Kansas City (March, 1997).

“Bose-Einstein condensation,” invited talk, King Saud University, Riyadh, Saudi Arabia (March, 1997) .

“Bose-Einstein condensation,” invited talk, King Abdul City for Science and Technology, Riyadh, Saudi Arabia (March, 1997).

“Bose-Einstein condensation,” invited talk, National Academy of Science, Washington, D.C. (April, 1997).

“Bose-Einstein condensation: Resent results,” invited talk, University of Washington, Seattle (May, 1997).

“Excitations and thermodynamic properties in Bose-Einstein condensation,” invited talk, Il Ciocco, Italy (July, 1997).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold physics: BEC in a dilute gas,” invited talk, Tulane University, New Orleans (October, 1997).

“Creating a new form of matter at the coldest temperature in the universe,” invited talk, National Science Teachers’ Association, Denver (November, 1997).

“Experiments in mixed-species Bose-Einstein condensates,” invited talk, Harvard University (January, 1998).

“Three years of BEC experiments,” invited talk, University of Florence, Italy (February, 1998).

“Experiments in two-component condensates,” invited talk, University of Pisa, Italy (March, 1998).

“BEC: What have we learned in three years?” invited talk, University of Milan, Italy (March, 1998).

“Bose-Einstein condensation,” invited talk, University of Trento, Italy (March, 1998).

“Experiments in two-component condensates,” invited talk, Ecole Normale Superieure, Paris, France (April, 1998).

“Experiments in two-component BEC,” invited talk, Institute of Theoretical Physics, Santa Barbara (May, 1998).

“BEC: Cold new results,” invited talk, CLEO/IQEC, San Francisco (May, 1998).

“Phase coherent BEC mixtures,” QFS, Amherst, MA (June, 1998).

“Experiments in Bose-Einstein condensation,” Enrico Fermi Summer School, Varenna, Italy (July, 1998).

“BEC mixtures,” invited talk, University of Texas, Austin (October, 1998).

“BEC: New physics below microkelvin,” invited talk, Colorado School of Mines, Golden (December, 1998).

“Two component BEC,” department colloquium, Ohio State University, Columbus (February, 1999).

Eric A. Cornell

Selected Presentations (continued)

“Experiments in atomic Bose-Einstein condensation,” invited talk, American Physical Society Meeting, Atlanta (March, 1999).

“Physics below a microkelvin,” invited talk, The Miller Institute for Basic Research in Science, Berkeley (June, 1999).

“Winding and unwinding Bose-Einstein condensates,” invited talk, Aspen School of Physics, Bose-Einstein Condensation, Aspen (June, 1999).

“Experiments in Bose-Einstein condensation,” lectures, Les Houches Summer School, France (August, 1999).

“Experiments in two-component Bose-Einstein condensation,” invited talk, LT XXIII Conference, Helsinki (August, 1999).

“Vortices in condensates,” invited talk, European Research Conference on Bose-Einstein Condensation, San Feliu de Guixols, Spain (September, 1999).

“Bose-Einstein condensates and topology,” invited talk, Purdue University, West Lafayette (February 2000).

“Speed,” invited talk and demonstration, University of Colorado’s Mr. Wizard Program, Boulder (February 2000).

“Bose-Einstein condensation,” invited talk, 2000 Colorado Science and Engineering Fair, Ft. Collins (April 2000).

“Tying a knot in gas: Vortices in Bose-Einstein condensation,” department colloquium, Swarthmore College, Swarthmore (April 2000).

“Can you tie a knot in gas?” invited talk, The Franklin Institute, Philadelphia (April 2000).

“Correlations and implosions: Experiments in BEC with an adjustable scattering length,” invited talk, ICAP VII, Florence, Italy (June 2000).

“Quantum meteorology: Dynamics of a BEC vortex,” invited talk, ECT Conference on Rotating BECs, Trento, Italy (June 2000).

Eric A. Cornell

Selected Presentations (continued)

“Beyond the garden of G. P. Eden,” “Feshbach Resonances, Coherent Chemistry, and Condensate Implosions,” “Topology, Superfluidity and Vortices,” invited talks, Summer School on BEC and Atom Lasers, Cargese, France (July 2000).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” invited talk to Boulder Valley School District students, NCAR, Boulder (September 2000).

“The world within a millionth of a degree of absolute zero,” invited talk, Colorado Science Convention - Beyond 2000: Sound Science and Sustainability, Denver (September 2000).

“What does it mean to ‘twist’ a gas?” department colloquium, State University of New York, Stony Brook (October 2000).

“What does it mean to ‘twist’ a gas?” department colloquium, University of Oklahoma, Norman (October 2000).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” department colloquium, University of San Francisco, San Francisco (November 2000).

“Quantum meteorology: Solitons vs. vortices in the world below 20 nanokelvin,” invited talk, meeting of the Rocky Mountain Section of the Optical Society of America, Boulder (November 2000)

“The ultra-low temperature magnifying glass: Measurements with visible quantum wavefunctions,” invited talk, symposium on 100 Years of Quantum Theory, Berlin (December 2000).

“The low-temperature magnifying glass: Bose-Einstein condensation and the visible machinery of quantum mechanics,” invited talk, University of Arizona, Tucson (February 2001).

“The low-temperature magnifying glass: Bose-Einstein condensation and the visible machinery of quantum mechanics,” department colloquium, York University, Toronto (March 2001).

Eric A. Cornell

Selected Presentations (continued)

“The low-temperature magnifying glass: Bose-Einstein condensation and the visible machinery of quantum mechanics,” department colloquium, University of Michigan, Ann Arbor (March 2001).

“The low-temperature magnifying glass: Bose-Einstein condensation and the visible machinery of quantum mechanics,” department colloquium, University of Colorado, Boulder (April 2001).

“Quantum information-related BEC work at JILA,” invited talk, NIST QIBEC Seminar, Washington, DC (April 2001).

“The story of laser cooling and BEC at NBS/NIST,” invited talk, APS Annual Meeting, Washington, DC (April 2001).

“Rotating Bose-Einstein condensates,” invited talk, CLEO/QELS, Baltimore (May 2001).

“Coherence and decoherence in magnetically trapped ultra-cold Rubidium-87,” invited talk, Eighth Rochester Conference on Quantum Optics (CQO8), Rochester (June 2001).

“Vortices from rotating clouds,” invited talk, Gordon Conference on Atomic Physics, Williamstown (June 2001).

“Coherence and decoherence in condensed and noncondensed ultracold atoms,” Enrico Fermi Summer School, Varenna, Italy (July 2001).

“The ultra-low temperature magnifying glass: How Bose-Einstein condensation makes quantum mechanics visible,” invited talk, SPIE, San Diego (August 2001).

“Bose-Einstein Condensation experiments at JILA,” invited talk, European Research Conference on Bose-Einstein Condensation, San Feliu de Guixols, Spain (September 2001).

“Artifice and equilibrium: Experiments with synthetic and natural vortices in a superfluid gas,” department colloquium, Cornell University, Ithaca (October 2001).

“Artifice and equilibrium: Experiments with synthetic and natural vortices in a superfluid gas,” invited talk, MIT, Cambridge (November 2001).

“Stone cold science: BEC and the weird world within a millionth of a degree from absolute zero,” invited talk, CRLS High School, Cambridge (November 2001).

Eric A. Cornell

Selected Presentations (continued)

“Weird spin dynamics in an ultra-cold rubidium gas just above T_c ,” department colloquium, Harvard, Cambridge (November 2001).

“Bose-Einstein condensation,” department colloquium, Yale University, New Haven (November 2001).

“Natural and artificial vortices in BEC,” invited talk, 2001 Jubilee Nobel Symposium of Physics, Goteberg (December 2001).

“Bose-Einstein Condensation in dilute gases of alkali atoms,” invited talk, University of Helsinki, Helsinki (December 2001).

“Physics within a millionth of a degree of absolute zero: The story of Bose-Einstein Condensation,” invited talk, Umea University, Umea (December 2001).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” department colloquium, Reed College, Portland (February 2002).

“Artifice and equilibrium: Experiments with synthetic and natural vortices in a superfluid gas,” department colloquium, Stanford University, Stanford (February 2002).

“Stone cold science: BEC and the weird world within a millionth of a degree from absolute zero,” invited talk, Stanford University, Stanford (February 2002).

“Stone cold science: BEC and the weird world within a millionth of a degree from absolute zero,” invited talk, Boulder Valley School District high school students, NCAR (February 2002).

“Artifice and equilibrium: Experiments with synthetic and natural vortices in a superfluid gas,” department colloquium, University of Texas, Austin (February 2002).

“The Bose-Einstein Condensation,” APS - Division of Laser Science invited talk, Texas Tech University, Lubbock (February 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” public lecture, NIST, Gaithersburg (March 2002).

“Highly rotating Bose-Einstein condensates,” invited talk, Southwestern Quantum Information and Technology Network (SQUINT), NIST, Boulder (March 2002).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” department colloquium, University of New Mexico, Albuquerque (March 2002).

“Experiments in Bose-Einstein condensation at JILA,” workshop, Utrecht University, Utrecht (April 2002).

“Experiments in Bose-Einstein condensation at JILA,” plenary lecture at the Dutch Physical Society Meeting, Groningen (April 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” Eberly Family Distinguished Lecture, Pennsylvania State University, State College (April 2002).

“Artifice and equilibrium: Experiments with synthetic and natural vortices in a superfluid gas,” department colloquium, Pennsylvania State University, State College (April 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” Alpheus Smith Lecture, Ohio State University, Columbus (May 2002).

“Rotating the irrotatable: Quantized vortices in a super-gas,” department colloquium, Centre College, Danville, KY (May 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Centre College, Danville, KY (May 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” presentation to Boulder Valley School District science teachers, Boulder (May 2002).

“Making the world’s coldest stuff: Two Coloradans tell how they won the Nobel Prize,” invited talk, Odyssey of the Mind participants, Boulder (May 2002).

“Stone cold science: BEC and the weird world of physics a millionth of a degree from absolute zero,” invited talk, Office of Naval Research, Arlington, VA (May 2002).

“Bose-Einstein condensation,” Nobel Session, DAMOP Conference, Williamsburg, VA (May 2002).

Eric A. Cornell

Selected Presentations (continued)

“Bose-Einstein condensation experiments in an ultracold atomic gas,” Herzberg Memorial Lecture, 2002 Congress of the Canadian Association of Physicists (CAP), Quebec City (June 2002).

“Bose-Einstein condensation experiments in an ultracold atomic gas,” International Symposium on Frontiers in Science, invited talk, Tsinghua University, Beijing, China (June 2002).

“Bose-Einstein condensation experiments at JILA,” invited talk, ICAP, Cambridge (July 2002).

“Bose-Einstein condensation,” invited talk, 23rd International Conference on Low Temperature Physics (LT23), Hiroshima (August 2002).

“Recent experiments in Bose-Einstein condensation at JILA,” invited talk, 7th Workshop on Atom Optics and Interferometry, Lunteren, The Netherlands (September 2002).

“Bose-Einstein condensation: The world’s coldest material,” Seoul National University and Korea University in Seoul, invited colloquium, Seoul (October 2002).

“Why I am a physicist,” Korea Science and Cultural Foundation, invited talk, Seoul (October 2002).

“Physics research and physics education for the 21st century,” Korean Physical Society Symposium on Science Education, invited talk, Seoul (October 2002).

“Physics: The ongoing adventure,” Korean Physical Society Symposium on Science Education, invited talk, Seoul (October 2002).

“Bose-Einstein condensation: Microscopic interactions, macroscopic coherence,” Korean Physical Society Symposium on Nanotechnology, invited talk, Seoul (October 2002).

“Stone cold physics: BEC and the weird world of physics a millionth of a degree from absolute zero,” invited talk, IBM’s Boulder Technical Vitality Council, Boulder (November 2002).

“Stone cold physics: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” invited public lecture, Lafayette College, Easton, PA (November 2002).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold physics: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” 2002 Katzenstein Distinguished Lecture, University of Connecticut, Storrs (November 2002).

“Rotating the irrotatable: quantized vortices in a super gas,” invited colloquium, Kansas State University, Manhattan (February 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Kansas State University, Manhattan (February 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, University of Kansas, Lawrence, (February 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, University of Nebraska, Lincoln (February 2003).

“Bose-Einstein condensation: New results from the ultracold frontier,” plenary lecture, 2003 American Association for the Advancement of Science (AAAS) Annual Meeting, Denver (February 2003).

“Bose-Einstein condensation, the world's coldest stuff,” invited talk, AAAS Junior Academy of Science, Boulder (February 2003).

“Rotating the irrotatable: quantum tornados in a supergas,” invited colloquium, Davidson College, Davidson, NC (March 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Davidson College, Davidson, NC (March 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” invited talk, Georgia Southern University, Statesboro (March 2003)

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” invited lecture, Lawrence Livermore National Lab, Livermore (March 2003).

Eric A. Cornell

Selected Presentations (continued)

“Rotating the irrotatable: quantum tornados in a supergas,” invited colloquium, Luther College, Decorah, IA (April 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Luther College, Decorah, IA (April 2003).

“Bose-Einstein condensation, the world's coldest stuff,” invited talk, Achievement Rewards for College Scientists Foundation, Inc. (ARCS), Denver (April 2003).

“Rapidly rotating condensates, and a little bit about spin waves,” invited talk, Workshop on Bose-Einstein Condensation and Optical Lattices, Minneapolis (May 2003).

“Bose-Einstein condensation: The nature of matter within a millionth of a degree of absolute zero,” invited talk, Universidad del Norte, Asuncion, Paraguay (May 2003).

“Bose-Einstein condensation: shock waves and vortices in a superfluid gas,” Third Touloukian Award Lecture at the 15th Symposium on Thermophysical Properties, Boulder (June 2003).

“Bose-Einstein condensation experiments in an ultracold atomic gas,” plenary lecture, Spanish Royal Society Centennial Conference, Madrid (July 2003).

“Experiments with degenerate gases at JILA,” invited talk, EURESCO Conference on Bose-Einstein Condensation, San Feliu de Guixols, Spain (September 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Lowell High School, San Francisco (September 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Alabama A & M University, Huntsville (October 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, University of Louisiana, Lafayette (October 2003).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Abilene Christian University, Abilene (November 2003).

Commencement address, Fall 2003 graduation ceremony, University of Colorado at Boulder (December 2003).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” keynote speaker, University of Colorado's 2004 Student Annual Research Symposium (February 2004).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, State University of New York at Geneseo (March 2004).

“Rotating the irrotatable: quantized vortices in a super-gas,” department colloquium, State University of New York at Geneseo (March 2004).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, Hamline University (April 2004).

“Rotating the irrotatable: quantized vortices in a super gas,” department colloquium, Hamline University (April 2004).

“Stone cold science: Things get weird around absolute zero,” public lecture, DAMOP (Division of Atomic, Molecular and Optical Physics of the American Physical Society) 2004, Tucson (May 2004).

Symposium of Nobel Laureates, ICAP (International Conference on Atomic Physics), Rio de Janeiro, Brazil (July 2004).

“What’s hot in cold atoms,” invited talk, FOPS: The Colorado Meeting on the Fundamental Optical Processes in Semiconductors, Estes Park (August 2004).

“Stone cold science: Things get weird around absolute zero,” public lecture, Lawrence University, Appleton (October 2004).

“Rotating the irrotatable: quantized vortices in a super-gas,” department colloquium, Lawrence University, Appleton (October 2004).

Eric A. Cornell

Selected Presentations (continued)

“Experiments with linear, nonlinear, and topological excitations in a superfluid gas,” plenary talk, Conference on Nonlinear Waves, Integrable Systems and Their Applications, Colorado Springs (June 2005).

“Experiments at JILA: Rotating lattices and Casimir forces,” European Science Foundation’s Conference on Ultracold Gases and Their Applications, Saint Feliu de Guixols, Spain (September 2005).

“A review of spin one-half BEC results: Spin waves and rotating spinors,” Workshop on Spinor and Multi-Component Bose-Einstein Condensates, invited talk, University of Barcelona (September 2005).

“Spin-1/2 condensates,” invited talk, workshop on Spinor and Multi-Component Bose-Einstein Condensation, Barcelona (September 2005).

“What was God thinking? Science can't tell,” invited talk, induction ceremony at the American Academy of Arts and Sciences, Cambridge (October 2005).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree above absolute zero,” public lecture, Marquette University, Milwaukee (October 2005).

“Rotating the irrotatable: Quantized vortices in a super gas,” department colloquium, Marquette University, Milwaukee (October 2005).

Testimony and remarks at a hearing of the Senate Committee on Commerce, Science and Transportation, Washington, DC (November 2005).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” Houston Lecture speaker, Rice University, Houston (February 2006).

“When is the vacuum not a vacuum? Casimir-Polder forces in the limit of very large atom-surface separation,” department colloquium, Rice University, Houston (February 2006).

Presentation on science to children at the “NIST Adventures in Science Program,” NIST, Gaithersburg (March 2006).

Eric A. Cornell

Selected Presentations (continued)

“Really cold atoms,” NIST Adventures in Science Program, guest speaker, Washington, DC (March 2006).

Testimony, Views on Science Policy of the Nobel Laureates from NIST, US House of Representatives Subcommittee on Environment, Technology and Standards, Washington, DC (May 2006).

“The catastrophic implosion of the universe: Coming sooner than you think? Musings on and measurements of the uncertainty principle,” invited talk, Nobel Symposium, Annual Meeting of the Division of Atomic, Molecular and Optical Physics (DAMOP), Knoxville (May 2006).

“Searching for an electron EDM in trapped molecular ions,” invited talk, Third International Symposium on Lepton Moments, Cape Cod (June 2006).

“Results from the last five years of the JILA Physics Frontier Center,” invited presentation, NSF Physics Frontier Center Directors' Meeting, Washington, DC (July 2006).

“Set my vortices free: Observing the Kosterlitz-Thouless crossover in an optical lattice,” department colloquium, University of Chicago, Chicago (April 2007).

“Searching for the electron's electric dipole moment in trapped molecular ions,” physics division colloquium, Argonne National Laboratory, Argonne (April 2007).

“Casimir forces at the boundary between classical and quantum,” invited talk, NIST Seminar, Boulder (October 2006).

“Is warm glass more sticky than cold glass?” Ta-You Lecture, University of Michigan, Ann Arbor (October 2006).

“An experiment to measure the electron's dipole moment using a trapped molecular ion,” department colloquium, University of Trento, Trento (November 2006).

“Adventures in particle land: Where low-energy physics meets high-energy physics,” department colloquium, University of Innsbruck, Innsbruck (November 2006).

“2-D lattices at JILA,” invited talk, March 2007 Meeting of the American Physical Society, Denver (March 2007).

Eric A. Cornell

Selected Presentations (continued)

“Set my vortices free: Observing the Kosterlitz-Thouless crossover in an optical lattice,” department colloquium, University of Chicago, Chicago (April 2007).

“Searching for the electron's electric dipole moment in trapped molecular ions,” Physics Division Colloquium, Argonne National Laboratory, Argonne (April 2007).

“Kosterlitz-Thouless transition on a 2-d lattice,” invited talk, Lorenzo M. Narducci Memorial Symposium on Advances in Coherence, Quantum Optics, and Atom Optics, Drexel University, Philadelphia (May 2007).

“Kosterlitz-Thouless cross-over observed in a Bose gas in a 2-d optical lattice,” invited talk, International Conference on Laser Spectroscopy, Telluride (June 2007).

Discussion leader, Bose and Fermi Gases I, Gordon Research Conference on Atomic Physics, Tilton (July 2007).

“Berezinskii-Kosterlitz transition on a lattice,” invited talk, From Entangled Photons to Atom Lasers Conference honoring 60th birthday of Alain Aspect, Paris (September 2007).

“Kosterlitz-Thouless transition in a two-dimensional lattice,” Symposium on “From Entangled Photons to Atom Lasers,” Paris (September 2007).

“Fluctuations and strong interactions in BEC,” BEC 07 - Frontiers in Quantum Gases, San Feliu de Guixols, Spain (September 2007).

“Set my vortices free: proliferation of vortices in a 2-d lattice of Bose-Einstein condensation in the Berezinskii-Kosterlitz-Thouless regime,” FetterFest: A Symposium on Quantum Fluids, Stanford University, Stanford (November 2007).

“Interaction of ultracold atoms with surfaces,” Office of Naval Research Atoms-on-a-Chip Workshop, Washington, DC (March 2008).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, University of Wisconsin at Madison, Madison (April 2008).

“Set my vortices free: observing the Kosterlitz-Thouless crossover in an optical lattice,” Physics Colloquium, University of Wisconsin at Madison, Madison (April 2008).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree from absolute zero,” public lecture, University of Wisconsin at LaCrosse, LaCrosse (April 2008).

“Set my vortices free: observing the Kosterlitz-Thouless crossover in an optical lattice,” Physics Colloquium, University of Wisconsin at LaCrosse, La Crosse (April 2008).

“Why is warm glass stickier than cold glass?” Physics Colloquium, Wayne State University, Detroit (April 2008).

“How symmetric is the electron? Looking for out-of-roundness of 10^{15} femtometers,” keynote speaker, Conference on Precision Electromagnetic Measurements, Broomfield, CO (May 2008).

“Precision measurements,” invited lecture, University of Michigan Quantum Summer School Program, Ann Arbor (June 2008).

“When is a quantum gas a quantum liquid?” invited talk, International Conference on Atomic Physics, Storrs (July 2008).

“Precision measurements of dipoles,” invited talk, Frontiers in Laser Cooling: Single-Molecule Biophysics and Energy Science, a scientific symposium honoring Steven Chu, Berkeley (August 2008).

“Stone cold physics,” public lecture, Colorado State University, Ft. Collins (October 2008).

“Can we measure the electron's out-of-roundness to 10^{15} femtometers?”, Department of Physics colloquium, Colorado State University, Ft. Collins (October 2008).

“Bragg spectroscopy in strongly interacting BECs”, invited talk , conference on Frontiers of Degenerate Quantum Gases’, Beijing (October 2008).

“Stone cold physics”, invited talk, University of Colorado’s Kittredge Honors Program, Boulder (November 2008).

“Research at JILA”, invited presentation, Governor’s Award for Research Impact, Denver (February 2009).

Eric A. Cornell

Selected Presentations (continued)

“Introduction to Bose-Einstein condensates”, invited talk, Workshop on Hawking Radiation, Valencia, Spain (February 2009).

“Stone cold science: Bose-Einstein condensation and the weird world of physics a millionth of a degree above absolute zero”, public lecture, Pomona College, Claremont, CA (March 2009).

“What’s special about the world of two dimensions? Examples with cold atoms”, Department of Physics and Astronomy colloquium, Pomona College, Claremont, CA (March 2009).

“Is warm glass stickier than cold glass?”, Department of Physics colloquium, Simon Fraser University, Burnaby, BC (April 2009).

“Set my vortices free: Observing the Kosterlitz-Thouless crossover in an optical lattice”, Department of Physics and Astronomy colloquium, University of British Columbia, Vancouver (April 2009).

“Can we measure electron out-of-roundness to 10^{-15} femtometers?”, invited talk, Colorado Cold Molecule Workshop (COCOMO), Boulder (July 2009).

“Recent BEC results at JILA”, invited talk, Bose-Einstein Condensation 2009: Frontiers in Quantum Gases, San Feliu, Spain (September 2009).

“Is warm glass stickier than cold glass?”, department colloquium, Thiagarajar College of Engineering, Madurai, India (September 2009).

“Stone cold science, Bose-Einstein Condensation and the weird world of physics a millionth of a degree above absolute zero”, public lecture, University of Nevada, Reno (November 2009).

“How symmetric is the electron? Looking for out-of-roundness of 10^{15} “, India Institute of Science, Bangalore (March 2010).

“Is a warm glass stickier than a cold glass?”, Raman Institute, Bangalore (March 2010).

“Stone cold science: Bose-Einstein Condensation and the weird world of physics a millionth of a degree above absolute zero”, Indian Institute of Astrophysics, Bangalore (March 2010).

Eric A. Cornell

Selected Presentations (continued)

“Coordinate-and-momentum space distributions in 2-D Bose gases”, invited talk, ‘Frontiers in Atomic Physics’, Florence, Italy (April 2010).

“Towards an improved measurement of the electron’s electric dipole moment in a trapped molecular ion”, invited talk, Ohio State University International Symposium on Molecular Spectroscopy, Columbus (June 2010).

“Searching for an electron electric dipole moment in trapped molecular ions”, invited talk, Third International Symposium on Lepton Moments, Cape Cod (July 2010).

“Ultracold JILA”, public talk, University of Colorado’s Baker Residence Hall, Boulder (August 2010).

“Why is warm glass stickier than cold glass?”, department colloquium, University of Oklahoma, Norman (September 2010).

Talk for Boulder History Museum’s ‘Boulder Conversations with Extraordinary People’, Boulder (October 2010).

“The quantum optics of stickiness”, invited talk, A National Celebration of the 50th Anniversary of the Laser, Glasgow (November 2010).

“Stone cold science: Bose-Einstein Condensation and the weird world of physics a millionth of a degree above absolute zero “, invited talk, National Youth Science Foundation’s Regional Science Symposium, Boulder (November 2010).

“Stone cold science: Bose-Einstein Condensation and the weird world of physics a millionth of a degree above absolute zero”, public lecture, American Institute of Physics Nobel Laureates Visitation Program at Southern Mississippi University, Hattiesburg (November 2010).

“Is warm glass stickier than cold glass?”, department colloquium, Southern Mississippi University, Hattiesburg (December 2010).

“Which does nature like best, lazy or sloppy?”, public lecture, Louisiana State University’s Chancellor’s Distinguished Lectureship Series, Baton Rouge (December 2010).

“A life in physics“, invited talk, Miramontes Arts and Sciences Program, University of Colorado, Boulder (January 2011).

Eric A. Cornell

Selected Presentations (continued)

“Stone cold science: Bose-Einstein Condensation and the weird world of physics a millionth of a degree from absolute zero”, public lecture, Saturday Physics Series, University of Colorado, Boulder (April 2011).

Can we measure the electron's out-of-roundness to 10^{15} femtometers?, department colloquium, University of Maryland's Joint Quantum Institute, College Park (April 2011).

“The quantum optics of stickiness”, invited talk, GriffinFest, Toronto (May 2011).