

Curriculum Vitae
Steven Lloyd Rolston

Address:

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Education:

1986: PhD. Nuclear Physics, State University of New York at Stony Brook.
laser spectroscopy of isotopes created with heavy-ion nuclear reactions.

1980: Bachelor of Arts, Wesleyan University, Middletown, Ct.
graduated summa cum laude, member of Phi Beta Kappa
departmental high honors in physics, awarded Bertman prize in physics

Employment:

Sept. 2003 – present: Full Professor, University of Maryland, College Park, MD.

1988 -2003: Physicist, National Institute of Standards and Technology,
Gaithersburg, Md.

1987 - 1988: Post-Doctoral Research Associate, Atomic Physics, Harvard Univ., Cambridge, MA.

1986 - 1987: Post-Doctoral Research Associate, Atomic Physics, Univ. of Washington, Seattle, WA.

Current Research Interests:

Ultracold neutral plasmas, Bose-Einstein condensation, quantum computation, non-linear atom optics, production of antihydrogen, atomic frequency standards, laser cooling

Awards, Memberships:

Fellow, American Physical Society
Fellow, Optical Society of America
Member, APS Council 2007
Member, Physical Review A Editorial Board 2002-2007
Member, APS Precision Measurements Topical Group Executive Committee 2002-2005
Member, DAMOP Executive Committee 2002-2005
Member, DAMOP Program Committee, 2001-2003
Chair, Atomic Physics Gordon Conference 2001
2001 Arthur S. Flemming Award
Visiting Professor, University of Innsbruck, Austria 2003
Lecturer, Enrico Fermi Summer School, Varenna, Italy 2001
Chair, ILS Program sub-committee 2000
Lecturer, Latin American Summer School in Physics, Mexico City, 1999
Vice-chair, Atomic Physics Gordon Conference 1999
Chair, DAMOP publications committee 1997
1991 RD100 for "parallel-processing RF spectrum analyzer"
1993 Sigma Xi Young Scientist Award
1996 U.S. Dept. of Commerce Silver Medal

Publications:

Over 100 publications, including *Nature* (3), *Science* (3), and *Physical Review Letters* (32).

Selected Publications:

Ultracold Neutral Plasmas

- "Observation of Collective Modes of Ultracold Plasmas," R. S. Fletcher, X. L. Zhang, and S. L. Rolston, *Phys. Rev. Lett.* **96**, 105003 (2006)
- "Electron temperature of ultracold plasmas," Roberts JL, Fertig CD, Lim MJ, Rolston SL, *Phys. Rev. Lett.* **92**, 253003 (2004) .
- "Formation of Rydberg atoms in an expanding ultracold neutral plasma," T. C. Killian, M. J. Lim, S. Kulin, R. Dumke, S. D. Bergeson, and S. L. Rolston, *Phys. Rev. Lett.* **86**, 3759 (2001).
- "Plasma oscillations and expansion of an ultracold neutral plasma," S. Kulin, T. C. Killian, S. D. Bergeson, and S. L. Rolston, *Physical Review Letters* **85**, 318-321 (2000).
- "Creation of an ultracold neutral plasma," T. C. Killian, S. Kulin, S. D. Bergeson, L. A. Orozco, C. Orzel, and S. L. Rolston, *Physical Review Letters* **83**, 4776-4779 (1999).

Optical Lattices

- "Strongly Inhibited Transport of a 1D Bose Gas in a Lattice," C.D. Fertig, K. M. O'Hara, J. Huckans, S. L. Rolston, W. D. Phillips, and J. V. Porto, *Phys. Rev. Lett.* **94**, 120403 (2005).
- "Observation of reduced three-body recombination in a correlated 1D degenerate Bose gas," Tolra BL, O'Hara KM, Huckans JH, Phillips WD, Rolston SL, Porto JV, *Phys. Rev. Lett.* **92**, 190401 (2004).
- "Patterned loading of a Bose-Einstein condensate into an optical lattice", Peil S, Porto JV, Tolra BL, Obrecht JM, King BE, Subbotin M, Rolston SL, Phillips WD *Phys. Rev. A* **67**, 051603 (2003).
- "Collapse and revivals of wave packets in optical lattices," G. Raithel, W. D. Phillips, and S. L. Rolston, *Phys. Rev. Lett.* **81**, 3615 (1998).
- "Bragg scattering from atoms in an optical lattice", G. Birkl, M. Gatzke, I. H. Deutsch, S. L. Rolston, and W. D. Phillips, *Phys. Rev. Lett.* **75**, 2823 (1995).
- "Observation of Quantized Motion of Rb Atoms in an Optical Field", P. S. Jessen, C. Gerz, P. D. Lett, W. D. Phillips, S. L. Rolston, R. J. C. Spreeuw and C. I. Westbrook, *Phys. Rev. Lett.* **69**, 49 (1992).

Atom Optics

- "Nonlinear and quantum atom optics," S. L. Rolston and W.D. Phillips, *Nature* **416**, 219 (2002).
- "Generating Solitons by Phase Engineering of a Bose-Einstein Condensate," J. Denschlag, J. E. Simsarian, D. L. Feder, C. W. Clark, L. A. Collins, J. Cubizolles, L. Deng, E. W. Hagley, K. Helmerson, W. P. Reinhardt, S. L. Rolston, B. I. Schneider and W. D. Phillips, *Science* **287**, 97 (2000).
- "Four-wave mixing with matter waves," L. Deng, E. W. Hagley, J. Wen, M. Trippenbach, Y. Band, P. S. Julienne, J. E. Simsarian, K. Helmerson, S. L. Rolston, and W. D. Phillips, *Nature* **398**, 218 (1999).
- "A well collimated quasi-continuous atom laser," E. W. Hagley, L. Deng, M. Kozuma, J. Wen, K. Helmerson, S. L. Rolston, and W. D. Phillips, *Science* **283**, 1706 (1999).
- "Coherent splitting of Bose-Einstein condensed atoms with optically induced Bragg diffraction," M. Kozuma, L. Deng, E. W. Hagley, J. Wen, R. Luttwak, K. Helmerson, S. L. Rolston, and W. D. Phillips, *Phys. Rev. Lett.* **82**, 871 (1999).

Laser cooled atoms and ultracold collisions

- "Deeply subrecoil two-dimensional Raman cooling," Boyer V, Lising LJ, Rolston SL, Phillips WD, Phys. Rev. A **70** (4): Art. No. 043405 (2004).
- "Time-resolved studies of ultracold ionizing collisions," C. Orzel, S. D. Bergeson, S. Kulin, and S. L. Rolston, Phys. Rev. Lett. **80**, 5053 (1998).
- "Optical Control of Ultracold Collisions of Metastable Xenon", M. Walhout, U. Sterr, C. Orzel, M. Hoogerland, and S.L. Rolston, Phys. Rev. Lett. **74**, 506 (1995).
- "Momentum transfer in laser-cooled cesium by adiabatic passage in a light field", L. Goldner, C. Gerz, R. Spreuw, S.L. Rolston, C. Westbrook, W. Phillips, and P. Zoller, Phys. Rev. Lett. **72**, 997 (1994).
- "Optical Molasses", P. Lett, W. Phillips, S.L. Rolston, C. Tanner, R. Watts, and C. Westbrook, Jour. Opt. Soc. Amer. **B6**, 2084 (1989).

Quantum information

- "Manipulation of single neutral atoms in optical lattices," C. Zhang, S. L. Rolston, and S. Das Sarma, Phys. Rev. A **74**, 042316 (2006)
- "Fast Quantum Gates for Neutral Atoms," D. Jaksch, J. I. Cirac, P. Zoller, S. L. Rolston, R. Cote, and M. D. Lukin, Phys. Rev. Lett. **85**, 2208 (2000).