

# RANDALL G. HULET

## Education:

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Ph.D., Physics, June, 1984.

STANFORD UNIVERSITY  
B.S., Physics, June, 1978.

## Positions:

RICE UNIVERSITY  
Fayez Sarofim Professor of Physics and Astronomy, 2000 to present.  
Professor of Physics, 1996 to 2000.  
Associate Professor of Physics, 1992 to 1996.  
Assistant Professor of Physics, 1987 to 1992.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY  
National Research Council Post-Doctoral Fellow, 1985 to 1987.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Post-Doctoral Research Associate, 1984 to 1985.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Research Assistant, 1978 to 1984.

## Honors and Awards:

Distinguished Scientist Award, Chinese Academy of Sciences, 2017.  
Herbert Walther Award, Optical Society of American and the German Physical Society, 2017.  
Davisson-Germer Prize of the American Physical Society, 2016.  
Willis E. Lamb Medal for Laser Science and Quantum Optics, 2011.  
Outstanding Referee for Physical Review and Physical Review Letters, 2010.  
Whitfield Lecturer, Penn State University, 2007.  
NASA Exceptional Scientific Achievement Medal, 2004.  
Member, American Academy of Arts and Sciences, 2003.  
Honorary Doctorate, Utrecht University, 2002.  
Visiting Professor, University of Innsbruck, 2002-3.  
Fellow, American Association for the Advancement of Science, 1997.  
Fellow, American Physical Society, 1996.  
I. I. Rabi Prize of the American Physical Society, 1995.  
Rosenthal Lecturer, Yale University, 1995.  
National Science Foundation Presidential Young Investigator Award, 1989.  
Alfred P. Sloan Research Fellow, 1988.

**Professional Service:**

Co-organizer of an Aspen Center for Physics Workshop on Cold Atoms, 2017.

Member, NSF Physics Frontier Center Review Committee, JILA, 2016.

Co-organizer of an Aspen Center for Physics Workshop on Cold Atoms, 2015.

Organized the Annual ARO/AFOSR MURI Annual Program Review Meeting for Ultracold Atoms, 2015.

Member, NASA Fundamental Physics Review Committee, 2013-2015.

Member of the International Advisory Committee of the 21st International Conference on Few-Body Problems in Physics, 2014-2015.

Chair, OSA Herbert Walther Prize Committee, 2013-2014.

General Member, Aspen Center for Physics, 2013-2015.

Elected to Chair-line of the APS Div. of Atomic, Molecular, and Optical Physics, 2012-2016.

Member, UC San Diego Department of Physics Review Committee, 2012.

Co-organizer of an Aspen Center for Physics Workshop on Cold Atoms, 2011.

Member, NSF Committee of Visitors, Chair of AMO Subcommittee, 2009.

Foreign Associate of the Canadian Institute for Advanced Research Quantum Materials Program, 2008-2014.

Chair of the Local Committee for the 2010 DAMOP Meeting, 2007-2010.

Chair of the APS Div. of Laser Science Nominating Committee, 2007.

Member of the Condensed Matter and Materials Physics Committee of the National Academy's Physics 2010 report, 2006-2007.

Member of the Editorial Board of the New Journal of Physics, 2005-2009

Member of the Physical Review A Editor Search Committee, 2005-2006.

Chair of the APS Div. of Atomic, Molecular, and Optical Physics Nominating Committee, 2004-2005.

Member of the Scientific Review Committee for the Earth & Sky radio program, 2000-05 .

Member of the International and the Joint Committees on Quantum Electronics, 2002-2004.

Chair of the Rabi Prize Selection Committee of the APS, 2002-2003.

Member of the APS Div. of Atomic, Molecular, and Optical Physics Executive Committee, 1998-2001.

Member of the APS Div. of Laser Science Executive Committee, 1998-2001.

Member of the Visiting Committee for FAPESP (Research Foundation of the State of Sao Paulo, Brazil) Research, Innovation and Diffusion Centers, 2000-2008.

Member of the APS Div. of Atomic, Molecular, and Optical Physics Program Committee,

1997-00.

Member of the Editorial Board of the *Reviews of Scientific Instruments*, 1996-99.

Chair of the Laser Cooling and Atom Trapping Program Sub-Committee of the 1997 Quantum Electronics and Laser Science Conference.

Co-editor of *Experimental Methods in the Physical Sciences*, Vols. 29A-C, 1994-97.

### **Publications:**

Jason H.V. Nguyen, De Luo, and Randall G. Hulet, "Formation of matter-wave soliton trains by modulational instability", *Science*, to be published (2017).

Melissa C. Revelle, Jacob A. Fry, Ben A. Olsen, and Randall G. Hulet, "1D to 3D Crossover of a Spin-Imbalanced Fermi Gas", *Physical Review Letters* **117**, 235301 (2016).

Randall G. Hulet, Pedro M. Duarte, Russell A. Hart, and T.-L. Yang, "Antiferromagnetism with Ultracold Atoms", *Laser Spectroscopy: Proceedings of the XXII International Conference*, Kai Dieckmann, ed. (World Scientific Press, Singapore, 2016).

Bo Liu, Xiaopeng Li, Randall G. Hulet, and W. Vincent Liu, "Detecting  $\pi$ -phase superfluids with  $p$ -wave symmetry in a quasi-1D optical lattice", *Physical Review A* **94**, 031602 (2016).

Ben A. Olsen, Melissa C. Revelle, Jacob A. Fry, Daniel E. Sheehy, and Randall G. Hulet, "Phase Diagram of a Strongly-Interacting Spin-Imbalanced Fermi Gas", *Physical Review A* **92**, 063616 (2015).

Thereza Paiva, Ehsan Khatami, Shuxiang Yang, Valery Rousseau, Mark Jarrell, Juana Moreno, Randall G. Hulet, Richard T. Scalettar, "Cooling Atomic Gases with Disorder", *Physical Review Letters* **115**, 240402 (2015).

P. M. Duarte, R. A. Hart, T.-L. Yang, X. Liu, T. Paiva, E. Khatami, R. T. Scalettar, N. Trivedi, and R. G. Hulet, "Compressibility of a fermionic Mott insulator of ultracold atoms", *Physical Review Letters* **114**, 070403 (2015).

Russell A. Hart, Pedro M. Duarte, Tsung-lin Yang, Xinxing Liu, Thereza Paiva, Ehsan Khatami, Richard T. Scalettar, Nandini Trivedi, David A. Huse, and Randall G. Hulet, "Observation of antiferromagnetic correlations in the Hubbard model with ultracold atoms", *Nature* **519**, 211-214 (2015).

Jason H.V. Nguyen, Paul Dyke, De Luo, Boris A. Malomed, and Randall G. Hulet, "Collisions of matter-wave solitons", *Nature Physics* **10**, 918-922 (2014).

P. Dyke, S. E. Pollack, and R. G. Hulet, "Finite range corrections near a Feshbach resonance and their role in the Efimov effect", *Physical Review A* **88**, 023625 (2013).

J. Cuevas, P. G. Kevrekidis, B. A. Malomed, P. Dyke, and R. G. Hulet, "Interactions of solitons with a Gaussian barrier: Splitting and recombination in quasi-1D and 3D", *New Journal of Physics* **15**, 063006 (2013).

Charles J. M. Mathy, David A. Huse, and Randall G. Hulet, "Enlarging and cooling the Néel state in

an optical lattice”, *Physical Review A* **86** 023606 (2012).

K. Levin and Randall G. Hulet, “The Fermi Gases and Superfluids: Short Review of Experiment and Theory for Condensed Matter Physicists”, chapter in *Contemporary Concepts of Condensed Matter Science*, P. B. Allen, E. Burstein, D. L. Mills, P.J. Stiles, series eds; K. Levin, A. L. Fetter, and D. M. Stamper-Kurn, vol. eds, pgs. 69-94 (Elsevier, Oxford, 2012).

P. M. Duarte, R. A. Hart, J. M. Hitchcock, T. A. Corcovilos, T.-L. Yang, A. Reed, and R. G. Hulet, “All-Optical Production of a Lithium Quantum Gas Using Narrow-Line Laser Cooling”, *Physical Review A* **84**, 061406 (2011).

Y. A. Liao, M. Revelle, T. Paprotta, A. S. C. Rittner, Wenhui Li, G. B. Partridge, and R. G. Hulet, “Metastability in Spin-Polarized Fermi Gases”, *Physical Review Letters* **107**, 145305 (2011).

D. Dries, S. E. Pollack, J. M. Hitchcock, and R. G. Hulet, “Dissipative Transport of a Bose-Einstein Condensate”, *Physical Review A* **82**, 033603 (2010).

S. E. Pollack, D. Dries, R. G. Hulet, K. M. F. Magalhães, E. A. L. Henn, E. R. F. Ramos, M. A. Caracanhas, and V. S. Bagnato, “Collective excitation of a Bose-Einstein condensate by modulation of the atomic scattering length”, *Physical Review A* **81**, 053627 (2010).

R. G. Hulet, "Photoassociation of Ultracold Atoms", *Proceedings of the Dalgarno Celebratory Symposium*, James F. Babb, Kate Kirby, and Hossein Sadeghpour, eds. (Imperial College Press, London, 2010).

Yean-an Liao, Ann Sophie C. Rittner, Tobias Paprotta, Wenhui Li, Guthrie B. Partridge, Randall G. Hulet, Stefan Baur, and Erich J. Mueller, “Spin-Imbalance in a One-Dimensional Fermi Gas”, *Nature* **467**, 567 (2010).

T. A. Corcovilos, S. K. Baur, J. M. Hitchcock, E. J. Mueller, and R. G. Hulet, “Detecting antiferromagnetism of atoms in an optical lattice via optical Bragg scattering”, *Physical Review A* **81**, 013415 (2010).

S. E. Pollack, D. Dries, and R. G. Hulet, “Universality in Three- and Four-Body Bound States of Ultracold Atoms”, *Science* **326**, 1683-6 (2009).

S. E. Pollack, D. Dries, M. Junker, Y. P. Chen, T. A. Corcovilos, and R. G. Hulet, “Extreme tunability of interactions in a  $^7\text{Li}$  Bose-Einstein condensate”, *Physical Review Letters* **102**, 090402 (2009).

Wenhui Li, G. B. Partridge, Y. A. Liao and R. G. Hulet, “Polarized Atomic Fermi Gases”, *International Journal of Modern Physics B* **23**, 3195-3204 (2009).

Yong P. Chen, J. Hitchcock, D. Dries, M. Junker, C. Welford, S. E. Pollack, T. A. Corcovilos, and R. G. Hulet, “Experimental Studies of Bose-Einstein Condensates in Disorder”, *Physica D* **238**, 1321 (2009).

R. G. Hulet, D. Dries, M. Junker, S. E. Pollack, J. Hitchcock, Y. P. Chen, T. Corcovilos, and C. Welford, “Tunable Interactions in a Bose-Einstein Condensate of Lithium: Photoassociation and Disorder-Induced Localization”, *Proceedings of the XXI International Conference on Atomic Physics*,

Robin Côté, Phillip L. Gould, Michael Rozman, and Winthrop W. Smith, eds. (World Scientific, Singapore, 2009), pp. 150-159.

M. Junker, D. Dries, C. Welford, J. Hitchcock, Y. P. Chen, and R. G. Hulet, "Photoassociation of a Bose-Einstein Condensate near a Feshbach Resonance", *Physical Review Letters* **101**, 060406 (2008).

Yong P. Chen, J. Hitchcock, D. Dries, M. Junker, C. Welford, and R. G. Hulet, "Phase coherence and superfluid-insulator transition in a disordered Bose-Einstein condensate", *Physical Review A* **77**, 033632 (2008).

Randall G. Hulet, Guthrie B. Partridge, Wenhui Li, and Y. A. Liao, "Fermion Pairing with Unequal Spin Populations", in *Coherence and Quantum Optics IX*, N. P. Bigelow, J. H. Eberly, and C. R. Stroud, Jr. (Optical Society of America, Washington, 2008), pp. 110-115.

Hiroki Saito, Randall G. Hulet, and Masahito Ueda, "Stabilization of a Bose-Einstein droplet by hyperfine Rabi oscillations", *Physical Review A* **76**, 053619 (2007).

Wenhui Li, G. B. Partridge, Y. A. Liao, and R. G. Hulet, "Pairing of a trapped Fermi gas with unequal spin populations", *Nuclear Physics A* **790**, 88c-95c (2007).

G. B. Partridge, Wenhui Li, Y. A. Liao, and R. G. Hulet, "Pairing, Phase Separation, and Deformation in the BEC-BCS Crossover", *Journal of Low Temperature Physics* **148**, 323-330 (2007).

Guthrie B. Partridge, Wenhui Li, Yean-an Liao, Randall G. Hulet, Masudul Haque, and H.T.C. Stoof, "Deformation of a Trapped Fermi Gas with Unequal Spin Populations", *Physical Review Letters* **97**, 190407 (2006).

Guthrie B. Partridge, Wenhui Li, Ramsey I. Kamar, Yean-an Liao, and Randall G. Hulet, "Pairing and Phase Separation in a Polarized Fermi Gas", *Science* **311**, 503 (2006).

G. B. Partridge, K. E. Strecker, R. I. Kamar, M. W. Jack, and R. G. Hulet, "Molecular Probe of Pairing in the BEC/BCS Crossover", *Physical Review Letters* **95**, 020404 (2005).

K. E. Strecker, G. B. Partridge, R. I. Kamar, and R. G. Hulet, "Conversion of an Atomic Fermi Gas to a Molecular Bose-Einstein Condensate", in *Atomic Physics 19, Proceedings of the Nineteenth International Conference on Atomic Physics*, L. G. Marcassa, K. Helmerson, and V. S. Bagnato, eds. (American Institute of Physics Conference Proceedings, vol. 770, pg. 246, New York, 2005).

K. E. Strecker, G. B. Partridge, A. G. Truscott, and R. G. Hulet, "Tunable interactions in ultracold Bose gases", *Advances in Space Research* **35**, 78 (2005).

Randall G. Hulet, "Atomic Fermi gases", in the 2004 McGraw-Hill Yearbook of Science & Technology, pp. 19-21 (McGraw-Hill, 2004).

Kevin E. Strecker, Guthrie B. Partridge, and Randall G. Hulet, "Conversion of an Atomic Fermi Gas to a Long-Lived Molecular Bose Gas", *Physical Review Letters* **91**, 080406 (2003).

K. E. Strecker, G. B. Partridge, A. G. Truscott, and R. G. Hulet, "Bright matter wave solitons in Bose-Einstein condensates", *New Journal of Physics* **5**, 73.1-73.8 (2003).

I. D. Prodan, M. Pichler, M. Junker, R. G. Hulet, and J. L. Bohn, "Intensity Dependence of

- Photoassociation in a Quantum Degenerate Atomic Gas”, *Physical Review Letters* **91**, 080402 (2003).
- C. A. Sackett, J. M. Gerton, M. Welling, and R. G. Hulet, “Macroscopic Quantum Tunneling in Bose-Einstein Condensates”, in *Exploring the Quantum/Classical Frontier: Recent Advances in Macroscopic and Mesoscopic Quantum Phenomena*, J. R. Friedman and S. Han, eds. (Nova Science, Commack, NY, 2003), pgs. 361-378.
- U. Al Khawaja, H. T. C. Stoof, R. G. Hulet, K. E. Strecker, and G. B. Partridge, “Bright Soliton Trains of Trapped Bose-Einstein Condensates”, *Physical Review Letters* **89**, 200404 (2002).
- K. E. Strecker, G. B. Partridge, A. G. Truscott, and R. G. Hulet, “Formation and Propagation of Matter Wave Soliton Trains”, *Nature* **417**, 150 (2002).
- Randall G. Hulet, Kevin E. Strecker, Andrew G. Truscott, and Guthrie Partridge, “ $^6\text{Li}$  and  $^7\text{Li}$ : Non-Identical Twins”, in *Laser Spectroscopy: Proceedings of the XV International Conference*, S. Chu, V. Vuletic, A. J. Kerman, and C. Chin, eds. (World Scientific, Singapore, 2002).
- Randall G. Hulet and Jordan M. Gerton, “Quantum Degeneracy in Lithium Gases”, in *Trapped Particles and Fundamental Physics*, S. N. Atutov, R. Calabrese, and L. Moi, eds. (Kluwer, Dordrecht, 2002).
- J. M. Gerton, B. J. Frew, and R. G. Hulet, “Photoassociative Frequency Shift in a Quantum Degenerate Gas”, *Physical Review A* **64**, 053410 (2001).
- Randall G. Hulet, “Bose-Einstein condensation: Getting excited about helium”, News and Views, *Nature* **411**, 425 (2001).
- C. A. Sackett and R. G. Hulet, “Dynamics of Bose-Einstein condensation in a gas with attractive interactions”, *Journal of Optics B: Quantum and Semiclassical Optics* **3**, R1-R28 (2001).
- Andrew G. Truscott, Kevin E. Strecker, William I. McAlexander, Guthrie Partridge, and Randall G. Hulet, “Observation of Fermi Pressure in a Gas of Trapped Atoms”, *Science* **291**, 2570 (2001); published online 1 March 2001; 10.1126/science.1059318.
- A. K. Pattanayak, A. Gammal, C. A. Sackett, and R. G. Hulet, “Stabilizing an Attractive Bose-Einstein Condensate by Driving a Surface Collective Mode”, *Physical Review A* **63**, 033604 (2001).
- J. M. Gerton, D. Strekalov, I. Prodan, and R. G. Hulet, “Direct Observation of Growth and Collapse of a Bose-Einstein Condensate with Attractive Interactions”, *Nature* **408**, 692 (2000).
- C. A. Sackett and R. G. Hulet, “A New State of Matter: An Introduction to Bose-Einstein Condensation”, *Science Spectra*, Issue 21, 52 (Gordon and Breach, 2000).
- Randall G. Hulet, “Ultracold Fermion Race is On”, *Physics World* **12**, 19 (August, 1999).
- B. Ghaffari, J. M. Gerton, W. I. McAlexander, K. E. Strecker, D. M. Homan, and R. G. Hulet, “Laser-Free Slow Atom Source”, *Physical Review A* **60**, 3878 (1999).
- Weiping Zhang, C. A. Sackett, and R. G. Hulet, “Optical Detection of a BCS Phase Transition in a Trapped Gas of Fermionic Atoms”, *Physical Review A* **60**, 504 (1999).

- J. M. Gerton, C. A. Sackett, B. Frew, and R. G. Hulet, “Dipolar Relaxation Collisions in Magnetically Trapped  ${}^7\text{Li}$ ”, *Physical Review A* **59**, 1514 (1999).
- C. A. Sackett, J. M. Gerton, M. Welling, and R. G. Hulet, “Probing a Bose-Einstein Condensate by Near-Resonant Light Scattering”, in *Spectral Lineshapes: Volume 10*, Proceedings of the Fourteenth International Conference on Spectral Lineshapes (American Institute of Physics Conference Proceedings #467, New York, 1999), R. Herman, ed.
- C. A. Sackett, J. M. Gerton, M. Welling, and R. G. Hulet, “Collective Collapse of a Bose-Einstein Condensate with Attractive Interactions”, in *Atomic Physics 16*, Proceedings of the Sixteenth International Conference on Atomic Physics (American Institute of Physics Conference Proceedings #477, New York, 1999), W. E. Baylis and G. W. F. Drake, eds.
- C. A. Sackett, J. M. Gerton, M. Welling, and R. G. Hulet, “Measurements of Collective Collapse in a Bose-Einstein Condensate with Attractive Interactions”, *Physical Review Letters* **82**, 876 (1999).
- M. Houbiers, H. T. C. Stoof, W. I. McAlexander, and R. G. Hulet, “Elastic and inelastic collisions of  ${}^6\text{Li}$  atoms in magnetic and optical traps”, *Physical Review A* **57**, R1497 (1998).
- C. A. Sackett, C. C. Bradley, M. Welling, and R. G. Hulet, “Bose-Einstein Condensation of Lithium - The Role of Interactions”, in *Photonic, Electronic and Atomic Collisions*, F. Aumayr and H. Winter, eds., World Scientific (Singapore), 1998.
- C. A. Sackett, H. T. C. Stoof, and R. G. Hulet, “Growth and Collapse of a Bose Condensate with Attractive Interactions”, *Physical Review Letters* **80**, 2031 (1998).
- M. Houbiers, R. Ferwerda, H. T. C. Stoof, W. I. McAlexander, C. A. Sackett, and R. G. Hulet, “The Superfluid State of Atomic  ${}^6\text{Li}$  in a Magnetic Trap”, *Physical Review A* **56**, 4864 (1997).
- C. A. Sackett, C. C. Bradley, M. Welling, and R. G. Hulet, “Bose-Einstein Condensation of Lithium”, *Applied Physics B* **65**, 433 (1997).
- J. G. Story, N. W. M. Ritchie, and R. G. Hulet, “Measurement of a Weak Value”, *Zeitschrift für Naturforschung A* **52**, 31 (1997).
- C. A. Sackett, C. C. Bradley, M. Welling, and R. G. Hulet, “Bose-Einstein Condensation of Lithium”, *Brazilian Journal of Physics* **27**, 154 (1997).
- R. G. Hulet, C. C. Bradley, and C. A. Sackett, “Bose-Einstein Condensation of Lithium”, *Proceedings of SPIE* **2995**, 232 (1997).
- E. R. I. Abraham, W. I. McAlexander, J. M. Gerton, R. G. Hulet, R. Côté, and A. Dalgarno, “Triplet *s*-Wave Resonance in  ${}^6\text{Li}$  Collisions and Scattering Lengths of  ${}^6\text{Li}$  and  ${}^7\text{Li}$ ”, *Physical Review A* **55**, R3299 (1997).
- C. C. Bradley, C. A. Sackett, and R. G. Hulet, "Analysis of *In Situ* Images of Bose-Einstein Condensates of Lithium”, *Physical Review A* **55**, 3951 (1997).
- C. C. Bradley, C. A. Sackett, and R. G. Hulet, "Bose-Einstein Condensation of Lithium: Observation of Limited Condensate Number”, *Physical Review Letters* **78**, 985 (1997).

- C. A. Sackett, C. C. Bradley and R. G. Hulet, "Optimization of Evaporative Cooling", *Physical Review A* **55**, 3797 (1997).
- C. C. Bradley and R. G. Hulet, "Laser Cooling and Atom Trapping", in *Atomic, Molecular, and Optical Physics*, v. 29B, F. B. Dunning and R. G. Hulet, eds., Academic (San Diego), 1996.
- W. I. McAlexander, E. R. I. Abraham, and R. G. Hulet, "Radiative Lifetime of the 2P State of Lithium", *Physical Review A* **54**, R5 (1996).
- E. R. I. Abraham, W. I. McAlexander, J. M. Gerton, R. G. Hulet, R. Côté, and A. Dalgarno, "Singlet s-Wave Scattering Lengths of  ${}^6\text{Li}$  and  ${}^7\text{Li}$ ", *Physical Review A* **53**, R3713 (1996).
- E. R. I. Abraham, W. I. McAlexander, H. T. C. Stoof, and R. G. Hulet, "Hyperfine Structure in Photoassociative Spectra of  ${}^6\text{Li}_2$  and  ${}^7\text{Li}_2$ ", *Physical Review A* **53**, 3092 (1996).
- H. T. C. Stoof, M. Houbiers, C. A. Sackett, and R. G. Hulet, "Superfluidity of Spin-Polarized  ${}^6\text{Li}$ ", *Physical Review Letters* **76**, 10 (1996).
- E. R. I. Abraham, N. W. M. Ritchie, W. I. McAlexander, and R. G. Hulet, "Photoassociative Spectroscopy of Long-Range States of Ultracold  ${}^6\text{Li}_2$  and  ${}^7\text{Li}_2$ ", *Journal of Chemical Physics* **103**, 7773 (1995).
- C. C. Bradley, C. A. Sackett, J. J. Tollett, and R. G. Hulet, "Evidence of Bose-Einstein Condensation in an Atomic Gas with Attractive Interactions", *Physical Review Letters* **75**, 1687 (1995).
- R. Côté, A. Dalgarno, Y. Sun, and R. G. Hulet, "Photoabsorption by Ultracold Atoms and the Scattering Length", *Physical Review Letters* **74**, 3581 (1995).
- E. R. I. Abraham, W. I. McAlexander, C. A. Sackett, and R. G. Hulet, "Spectroscopic Determination of the S-Wave Scattering Length of Lithium", *Physical Review Letters* **74**, 1315 (1995).
- J. J. Tollett, C. C. Bradley, C. A. Sackett, and R. G. Hulet, "A Permanent Magnet Trap for Cold Atoms", *Physical Review A* **51**, R22 (1995).
- W. I. McAlexander, E. R. I. Abraham, N. W. M. Ritchie, C. J. Williams, H. T. C. Stoof, and R. G. Hulet, "Precise Atomic Radiative Lifetime Via Photoassociative Spectroscopy of Ultracold Lithium", *Physical Review A* **51**, R871 (1995).
- N. W. M. Ritchie, E. R. I. Abraham, Y. Y. Xiao, C. C. Bradley, R. G. Hulet, and P. S. Julienne, "Trap Loss Collisions of Ultracold Lithium Atoms", *Physical Review A* **51**, R890 (1995).
- C. A. Sackett, J. Chen, J. J. Tollett, and R. G. Hulet, "Enhancement of Dipole Force Laser Cooling in Multilevel Atoms", *Laser Physics* **4**, 861 (1994).
- N. W. M. Ritchie, E. R. I. Abraham, and R. G. Hulet, "Trap Loss Collisions of  ${}^7\text{Li}$ : The Role of Trap Depth", *Laser Physics* **4**, 1066 (1994).
- A. J. Moerdijk, W. C. Stwalley, R. G. Hulet, and B. J. Verhaar, "Negative Scattering Length of Ultracold  ${}^7\text{Li}$  Gas", *Physical Review Letters* **72**, 40 (1994).
- U. Simon, C. E. Miller, C. C. Bradley, R. G. Hulet, R. F. Curl, and F. K. Tittel, "Difference



Frequency Generation in AgGaS<sub>2</sub> by Use of Single-Mode Diode-Laser Pump Sources", *Optics Letters* **18**, 1062 (1993).

J. Chen, J. G. Story, and R. G. Hulet, "The Evolution of Atomic Motion in an Intense Standing Wave", *Physical Review A* **47**, 2128 (1993).

J. Chen, J. G. Story, J. J. Tollett, and R. G. Hulet, "Adiabatic Cooling of Atoms by an Intense Standing Wave", *Physical Review Letters* **69**, 1344 (1992).

C. C. Bradley, J. G. Story, J. J. Tollett, J. Chen, N. W. M. Ritchie, and R. G. Hulet, "Laser Cooling of Lithium Using Relay Chirp Cooling", *Optics Letters* **17**, 349 (1992).

J. G. Story, N. W. M. Ritchie, and R. G. Hulet, "Weak Measurements", *Modern Physics Letters B* **5**, 1713 (1991).

N. W. M. Ritchie, J. G. Story, and R. G. Hulet, "Realization of a Measurement of a 'Weak Value'", *Physical Review Letters* **66**, 1107 (1991).

J. J. Tollett, J. Chen, J. G. Story, N. W. M. Ritchie, C. C. Bradley, and R. G. Hulet, "Observation of Velocity-Tuned Multiphoton 'Doppleron' Resonances in Laser Cooled Atoms", *Physical Review Letters* **65**, 559 (1990).

C. C. Bradley, J. Chen, and R. G. Hulet, "Instrumentation for the Stable Operation of Laser Diodes", *Reviews of Scientific Instruments* **61**, 2097 (1990).

D. J. Wineland, W. M. Itano, J. C. Bergquist, and R. G. Hulet, "The Digitized Atom and Optical Pumping", in *Atomic Physics 11*, S. Haroche, J. C. Gay, and G. Grynberg, eds., World Scientific Press (Singapore), 1989.

R. G. Hulet, D. J. Wineland, J. C. Bergquist, and W. M. Itano, "Precise Test of Quantum Jump Theory", *Physical Review A* **37**, 4544 (1988).

R. G. Hulet, J. C. Bergquist, W. M. Itano, J. J. Bollinger, C. H. Manney, and D. J. Wineland, "Quantum Optics Experiments with a Single Ion", in *Advances in Laser Science III*, A. C. Tam, J. L. Gole, and W. C. Stwalley, eds., A.I.P. Conf. Proc. **172**, New York, 1988.

W. M. Itano, J. C. Bergquist, R. G. Hulet, and D. J. Wineland, "Precise Optical Spectroscopy with Ion Traps", *Physica Scripta* **T22**, 79 (1988).

W. M. Itano, J. C. Bergquist, R. G. Hulet, and D. J. Wineland, "Radiative Decay Rates in Hg<sup>+</sup> From Observations of Quantum Jumps in a Single Ion", *Physical Review Letters* **59**, 2732 (1987).

W. M. Itano, J. C. Bergquist, R. G. Hulet, and D. J. Wineland, "The Observation of Quantum Jumps in Hg<sup>+</sup>", in *Laser Spectroscopy VIII*, W. Persson and S. Svanberg, eds., Springer Verlag (Berlin, Heidelberg), 1987.

R. G. Hulet and D. J. Wineland, "Quantum Jumps Via Spontaneous Raman Scattering", *Physical Review A* **36**, 2758 (1987).

D. J. Wineland, W. M. Itano, J. C. Bergquist, and R. G. Hulet, "Laser Cooling Limits and Single Ion

Spectroscopy", *Physical Review A* **36**, 2220 (1987).

J. C. Bergquist, R. G. Hulet, W. M. Itano, and D. J. Wineland, "Observation of Quantum Jumps in a Single Atom", *Physical Review Letters* **57**, 1699 (1986).

R. G. Hulet, E. S. Hilfer, and D. Kleppner, "Inhibited Spontaneous Emission by a Rydberg Atom", *Physical Review Letters* **55**, 2137 (1985).

R. G. Hulet, "Rydberg Atoms in 'Circular' States", in *Atomic Excitation and Recombination in External Fields*, M. H. Nayfeh and C. W. Clark, eds., Gordon and Breach (New York), 1985.

R. G. Hulet and D. Kleppner, "Rydberg Atoms in 'Circular' States", *Physical Review Letters* **51**, 1430 (1983).

M. L. Zimmerman, R. G. Hulet, and D. Kleppner, "Comparisons of Approximate Bases For Hydrogen in a Magnetic Field", *Physical Review A* **27**, 2731 (1983).

J. C. Castro, M. L. Zimmerman, R. G. Hulet, D. Kleppner, and R. R. Freeman, "Origin and Structure of the Quasi-Landau Resonances", *Physical Review Letters* **45**, 1780 (1980).

#### **Patents:**

R. G. Hulet, C. C. Bradley, J. M. Gerton, B. Ghaffari, W. I. McAlexander, S. C. Moss, C. A. Sackett, K. E. Strecker, and J. J. Tollett, "Laser-Free Source of Slow Atoms", *United States Patent* Number 6,657,188, December 2, 2003.

E. C. G. Sudarshan and R. G. Hulet, "Image Rotation Device", *United States Patent* Number 5,430,575, July 4, 1995.

E. C. G. Sudarshan and R. G. Hulet, "Optical Rotation Device", *United States Patent* Number 5,331,460, July 19, 1994.

#### **Presentations:**

Over 200 invited presentations in the past 10 years.