Phillip L. Gould September, 2018

Address: Department of Physics, U-3046
University of Connecticut
2152 Hillside Road
Storrs, CT 06269-3046
phone: 860-486-2950; fax: 860-486-3346;
e-mail: phillip.gould@uconn.edu

Place/Date of Birth: Wakefield, RI / February 12, 1958

Citizenship: USA

Education: Ph.D. in Physics (Atomic and Molecular), MIT, 1986.
Thesis: "Momentum Transfer to Atoms by the Absorption and Emission of Radiation" (advisor: D.E. Pritchard).
B.S. in Physics and Mathematics, Bates College, 1979.
Graduated Summa Cum Laude with High Honors.

Employment: University of Connecticut, Storrs, CT:
Professor of Physics, 1997-.
Associate Professor of Physics (with tenure), 1993-1997.
Assistant Professor of Physics, 1988-1993.
National Bureau of Standards, Gaithersburg, MD:
Physicist (NRC Postdoctoral Fellow with W.D. Phillips), 1986-1987.
Bell Telephone Laboratories, Holmdel, NJ:
Senior Technical Associate, 1979-1980.

Honors and Services:

Distinguished Referee for the European Physical Journal (2014)
Visiting Scientist, Laboratoire Aimé Cotton, Orsay, France (2011)
Outstanding and Exceptional Reviewer for Rev. Sci Instrum. (2011).
American Physical Society Outstanding Referee (2009).
Member Connecticut Academy of Science and Engineering (2006).
University of Connecticut Chancellor's Research Excellence Award (2002).
Guest Professor, University of Innsbruck (2001).
Alfred P. Sloan Research Fellowship (1990-1992).
National Science Foundation Presidential Young Investigator (1988-1993).
National Research Council Postdoctoral Fellowship (1986-1987).
MIT Physics Industrial Forum Fellowship (1983).
Member Phi Beta Kappa.
Series Editor, World Scientific Publishing: Series in Atomic, Molecular and Optical Physics (2008-2010).
Davisson-Germer Prize Selection Committee (2007-2009) (Chair, 2009).
DAMOP Executive Committee (2004-2007).
Editorial Board, Physical Review A (2003-2008).
DAMOP Thesis Prize Committee (2002).
Nominating Committee, DAMOP (2002-2003) (Chair, 2002).
Program Committee, 22st Int'l Conference on Atomic Physics (ICAP) 2010.
Co-Chair, 21st International Conference on Atomic Physics (ICAP) 2008.
DAMOP 2000, Local Organizing Committee.
Nominating Committee, APS Div. of Laser Science (1997-99) (Chair,1998).

Chair, 1997 Atomic Physics Gordon Conference.
Vice-Chair, 1995 Atomic Physics Gordon Conference.
ICPEAC General Committee (1997-2001).
NRC Committee on Atomic, Molecular, and Optical Science (1996-1999).
Program Committee, Quantum Electronics and Laser Science Conf. (1995,1997),
Subcommittee Chair, 2007.
U.S. Editor for Progress in Quantum Electronics (1989-1992).
Program Committee, International Laser Science Conf. (1987-1990, 2000).
Editorial Committee, Conf. on Precision Electromagnetic Measurements (1986).

Professional Societies:

American Physical Society (Fellow)
Optical Society of America

Research Interests:

Laser Cooling and Trapping, Ultracold Collisions, Photoassociative Spectroscopy, Ultracold Molecules, Ultracold Plasmas, Rydberg Atoms, Quantum Optics, Quantum Computing, Quantum Control, Atom Optics, Laser Spectroscopy.

PUBLICATIONS: September, 2018

Journal Articles / Book Chapters / Edited Books

"Deflection of a Molecular Beam Using the Bichromatic Stimulated Force," S.E. Galica, L. Aldridge, D.J. McCarron, E.E. Eyler, and P.L. Gould, Phys. Rev. A **98**, 023408 (2018).

"Directional Quantum-Controlled Chemistry: Generating Aligned Ultracold Molecules via Photoassociation," S. Kallush, J.L. Carini, P.L. Gould, and R. Kosloff, Phys. Rev. A **96**, 053613 (2017).

"High-Resolution Spectroscopy of Rydberg Molecular States of $^{85}Rb_2$ near the 5s + 7p Asymptote," R.A. Carollo, J.L. Carini, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **95**, 042516 (2017).

"Short-Range Photoassociation from the Inner Wall of the Lowest Triplet Potential of $^{85}Rb_2$," R.A. Carollo, J.L. Carini, E.E. Eyler, P.L. Gould, and W.C. Stwalley, J. Phys. B **49**, 194001 (2016).

"Efficient Formation of Ultracold Molecules with Chirped Nanosecond Pulses," J.L. Carini, S. Kallush, R. Kosloff, and P.L. Gould, J. Phys. Chem. A **120**, 3032 (2016).

"Nanosecond Pulse Shaping at 780 nm with Fiber-Based Electro-Optical Modulators and a Double-Passed Tapered Amplifier," C.E. Rogers III and P.L. Gould, Opt. Express **24**, 2596 (2016).

"Enhancement of Ultracold Molecule Formation Using Nanosecond Frequency Chirps," J.L. Carini, S. Kallush, R. Kosloff, and P.L. Gould, Phys. Rev. Lett. **115**, 173003 (2015).

"Enhancement of Ultracold Molecule Formation by Local Control in the Nanosecond Regime," J.L. Carini, S. Kallush, R. Kosloff, and P.L. Gould, New. J. Phys. **17**, 025008 (2015).

"Population Inversion in Hyperfine States of Rb with a Single Nanosecond Chirped Pulse in the Framework of a Four-Level System," G. Liu, V. Zakharov, T. Collins, P. Gould, and S.A. Malinovskaya, Phys. Rev. A **89**, 041803(R) (2014).

"Spectroscopy and Applications of the 3 $^3\Sigma^+$ Electronic State of $^{39}K^{85}Rb$," J. Banerjee, D. Rahmlow, R. Carollo, M. Bellos, E.E. Eyler, P.L. Gould, and W.C. Stwalley, J. Chem. Phys. **139**, 174316 (2013).

"Excitation of Weakly Bound Molecules to Trilobitelike Rydberg States," M.A. Bellos, R. Carollo, J. Banerjee, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. Lett. **111**, 053001 (2013).

"Spectroscopy of the Double Minimum 3 $^3\Pi_\Omega$ Electronic State of $^{39}K^{85}Rb$," J. Banerjee, D. Rahmlow, R. Carollo, M. Bellos, E.E. Eyler, P.L. Gould, and W.C. Stwalley, J. Chem. Phys. **138**, 164302 (2013).

"Approach to Form Long-Range Ion-Pair Molecules in an Ultracold Rb Gas," A. Kirrander, S. Rittenhouse, M. Ascoli, E.E. Eyler, P.L. Gould, and H.R. Sadeghpour, Phys. Rev. A **87**, 031402(R) (2013).

"Observation and Analysis of Resonant Coupling Between Nearly Degenerate Levels of the 2 $^1\Sigma_g^+$ and 1 $^1\Pi_g$ States of Ultracold $^{85}Rb_2$", R. Carollo, M.A. Bellos, D. Rahmlow, J. Banerjee, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **87**, 022505 (2013).

"Upper Bound to the Ionization Energy of $^{85}Rb_2$", M.A. Bellos, R. Carollo, J. Banerjee, M. Ascoli, A.-R. Allouche, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **87**, 012508 (2013).

"Production of Ultracold Molecules with Chirped Nanosecond Pulses: Evidence for Coherent Effects," J.L. Carini, J.A. Pechkis, C.E. Rogers III, P.L. Gould, S. Kallush, and R. Kosloff, Phys. Rev. A **87**, 011401(R) (2013).

"Spectroscopic Investigation of the A and 3 $^1\Sigma^+$ States of $^{39}K^{85}Rb$," J.-T. Kim, Y. Lee, B. Kim, D. Wang, P.L. Gould, E.E. Eyler, and W.C. Stwalley, J. Chem. Phys. **137**, 244301 (2012).

"Direct Photoassociative Formation of Ultracold KRb Molecules in the Lowest Vibrational Levels of the Electronic Ground State," J. Banerjee, D. Rahmlow, R. Carollo, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **86**, 053428 (2012).

"Photoassociation to the 2 $^1\Sigma_g^+$ State in Ultracold $^{85}Rb_2$ in the Presence of a Shape Resonance," M.A. Bellos, R. Carollo, D. Rahmlow, J. Banerjee, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **86**, 033407 (2012).

"Quantum Dynamical Calculations of Ultracold Collisions Induced by Nonlinearly Chirped Light," J.L. Carini, J.A. Pechkis, C.E. Rogers III, P.L. Gould, S. Kallush, and R. Kosloff, Phys. Rev. A **85**, 013424 (2012).

"Observation of a Resonant Four-Body Interaction in Cold Cesium Rydberg Atoms," J.H. Gurian, P. Cheinet, P. Huillery, A. Fioretti, J. Zhao, P.L. Gould, D. Comparat, and P. Pillet, Phys. Rev. Lett. **108**, 023005 (2012).

"Spectroscopic Prescription for Optimal Stimulated Raman Transfer of Ultracold Heteronuclear Molecules to the Lowest Rovibronic Level," J.T. Kim, Y. Lee, B. Kim, D. Wang, W.C. Stwalley, P.L. Gould, and E.E. Eyler, Phys. Rev. A **84**, 062511 (2011).

"Experimental Isotope Shifts of the 5 $^2S_{1/2}$ State and Low-Lying Excited States of Rb," L. Aldridge, P.L. Gould, and E.E. Eyler, Phys. Rev. A **84**, 034501 (2011).

"Formation of Ultracold Rb_2 Molecules in the v'' = 0 Level of the a $^3\Sigma_u^+$ State via Blue-Detuned Photoassociation to the 1 $^3\Pi_g$ State," M.A. Bellos, D. Rahmlow, R. Carollo, J. Banerjee, O. Dulieu, A. Gerdes, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Chem. Chem. Phys. **13**, 18880 (2011).

"Spectroscopic Analysis of the Coupled 1 $^1\Pi$, 2 $^3\Sigma^+$ ($\Omega = 0^-$, 1), and b $^3\Pi$ ($\Omega = 0^\pm$, 1, 2) States of the KRb Molecule Using both Ultracold Molecules and Molecular Beam Experiments," J.-T. Kim, Y. Lee, B. Kim, D. Wang, W.C. Stwalley, P.L. Gould, and E.E. Eyler, Phys. Chem. Chem. Phys. **13**, 18755 (2011).

"Creation of Arbitrary Time-Sequenced Line Spectra with an Electro-Optic Phase Modulator," C.E. Rogers III, J.L. Carini, J.A. Pechkis, and P.L. Gould, Rev. Sci. Instrum. **82**, 073107 (2011).

"Coherent Control of Ultracold ^{85}Rb Trap-Loss Collisions with Nonlinearly Frequency-Chirped Light," J.A. Pechkis, J.L. Carini, C.E. Rogers III, P.L. Gould, S. Kallush, and R. Kosloff, Phys. Rev. A **83**, 063403 (2011).

"Characterization and Compensation of the Residual Chirp in a Mach-Zehnder-Type Electro-Optical Intensity Modulator," C.E. Rogers III, J.L. Carini, J.A. Pechkis, and P.L. Gould, Opt. Express **18**, 1166 (2010).

"Upper Limit on the Magnetic Dipole Contribution to the 5*p*-8*p* Transition in Rb by Use of Ultracold Atom Spectroscopy," R. Pires, M. Ascoli, E.E. Eyler, P.L. Gould and A. Derevianko, Phys. Rev. A **80**, 062502 (2009).

"Ultracold Molecule Formation by Photoassociation," W.C. Stwalley, P.L. Gould, and E.E. Eyler, in Cold Molecules: Theory, Experiment, Applications, edited by R. Krems, W. Stwalley and B. Friedrich (Taylor and Francis, NY, 2009), pp. 169-219.

"Observation of Electric Quadrupole Transitions to Rydberg *nd* States of Ultracold Rubidium Atoms," D. Tong, S.M. Farooqi, E.G.M. van Kempen, Z. Pavlovic, J. Stanojevic, R. Côté, E.E. Eyler, and P.L. Gould, Phys. Rev. A **79**, 052509 (2009).

Proceedings of the XXI International Conference on Atomic Physics: Pushing the Frontiers of Atomic Physics, R. Côté, P.L. Gould, M. Rozman, and W.W. Smith, editors, World Scientific, Singapore (2009).

"Spectroscopy of ^{39}K^{85}Rb Triplet Excited States Using Ultracold $a^3\Sigma^+$ State Molecules Formed by Photoassociation," J.T. Kim, D. Wang, E.E. Eyler, P.L. Gould, and W.C. Stwalley, New Journal of Physics **11**, 055020 (2009).

"Cold Molecules Beat the Shakes" (invited Perspective article), P.L. Gould, Science **322**, 203 (2008).

"Long-Range Potentials and $(n\text{-}1)d + ns$ Molecular Resonances in an Ultracold Rydberg Gas," J. Stanojevic, R. Côté, D. Tong, E.E. Eyler, and P.L. Gould, Phys. Rev. A **78**, 052709 (2008).

"Enhancement of the Formation of Ultracold $^{85}Rb_2$ Molecules due to Resonant Coupling," H.K. Pechkis, D. Wang, Y. Huang, E.E. Eyler, P.L. Gould, W.C. Stwalley, and C.P. Koch, Phys. Rev. A **76**, 022504 (2007).

"Generation of Arbitrary Frequency Chirps with a Fiber-Based Phase Modulator and Self-Injection-Locked Diode Laser," C.E. Rogers III, M.J. Wright, J.L. Carini, J.A. Pechkis, and P.L. Gould, J. Opt. Soc. Am. B **24**, 1249 (2007).

"Coherent Control of Ultracold Collisions with Chirped Light: Direction Matters," M.J. Wright, J.A. Pechkis, J.L. Carini, S. Kallush, R. Kosloff, and P.L. Gould, Phys. Rev. A **75**, 051401(R) (2007).

"Superradiance in Ultracold Rydberg Gases," T. Wang, S.F. Yelin, R. Côté, E.E. Eyler, S.M. Farooqi, P.L. Gould, M. Kostrun, D. Tong, and D. Vrinceanu, Phys. Rev. A **75**, 033802 (2007).

"Rotationally Resolved Depletion Spectroscopy of Ultracold KRb Molecules," D. Wang, J.T. Kim, C. Ashbaugh, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **75**, 032511 (2007).

"Probing Ultracold Collisional Dynamics with Frequency-Chirped Pulses," M.J. Wright, J.A. Pechkis, J.L. Carini, and P.L. Gould, Phys. Rev. A **74**, 063402 (2006).

"Formation, Detection, and Spectroscopy of Ultracold Rb_2 in the Ground $X^1\Sigma_g^+$ State," Y. Huang, J. Qi, H.K. Pechkis, D. Wang, E.E. Eyler, P.L. Gould, and W.C. Stwalley, J. Phys. B **39**, S857 (2006).

"Spectra of Ultracold KRb Molecules in Near-Dissociation Vibrational Levels," D. Wang, E.E. Eyler, P.L. Gould, and W.C. Stwalley, J. Phys. B **39**, S849 (2006).

"Photoassociation of ^{85}Rb Atoms into 0_u^+ Sates Near the 5S+5P Atomic Limits," T. Bergeman, J. Qi, D. Wang, Y. Huang, H.K. Pechkis, E.E. Eyler, P.L. Gould, W.C. Stwalley, R.A. Cline, J.D. Miller, and D.J. Heinzen, J. Phys. B **39**, S813 (2006).

"Long-Range Rydberg-Rydberg Interactions and Molecular Resonances," J. Stanojevic, R. Côté, D. Tong, S. Farooqi, E.E. Eyler, and P.L. Gould, Eur. Phys. J. D **40**, 3 (2006).

"Quantum Random Walk with Rydberg Atoms in an Optical Lattice," R. Côté, A. Russell, E.E. Eyler, and P.L. Gould, New Journal of Physics **8**, 156 (2006).

"Detection by Two-Photon Ionization and Magnetic Trapping of Cold Rb_2 Triplet State Molecules," J. Lozeille, A. Fioretti, C. Gabbanini, Y. Huang, H.K. Pechkis, D. Wang, P.L. Gould, E.E. Eyler, W.C. Stwalley, M. Aymar, and O. Dulieu, Eur. Phys. J. D **39**, 261 (2006).

"State-Selective Detection of Near-Dissociation Ultracold KRb $X^1\Sigma^+$ and $a^3\Sigma^+$ Molecules," D. Wang, E.E. Eyler, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **72**, 032502 (2005).

"Contol of Ultracold Collisions with Frequency-Chirped Light," M.J. Wright, S.D. Gensemer, J. Vala, R. Kosloff, and P.L. Gould, Phys. Rev. Lett. **95**, 063001 (2005).

"The Photoassociative Spectrosccopy, Photoassociative Molecule Formation, and Trapping of Ultracold $^{39}K^{85}Rb$," D. Wang, J. Qi, M.F. Stone, O. Nikolayeva, B. Hattaway, S.D. Gensemer, H. Wang, W.T. Zemke, P.L. Gould, E.E. Eyler, and W.C. Stwalley, Eur. Phys. J. D **31**, 165 (2004).

"Photoassociative Production and Trapping of Ultracold KRb Molecules," D. Wang, J. Qi, M.F. Stone, O. Nikolayeva, H. Wang, B. Hattaway, S.D. Gensemer, P.L. Gould, E.E. Eyler, and W.C. Stwalley, Phys. Rev. Lett. **93**, 243005 (2004).

"Frequency-Chirped Light from an Injection-Locked Diode Laser," M.J. Wright, P.L. Gould, and S.D. Gensemer, Rev. Sci. Instrum. **75**, 4718 (2004).

"Local Blockade of Rydberg Excitation in an Ultracold Gas," D. Tong, S.M. Farooqi, J. Stanojevic, S. Krishnan, Y.P. Zhang, R. Cote, E.E. Eyler, and P.L. Gould, Phys. Rev. Lett. **93**, 063001 (2004).

"Landau-Zener Problem for Trilinear Systems," A. Ishkhanyan, M. Mackie, A. Carmichael, P.L. Gould, and J. Javanainen, Phys. Rev. A **69**, 043612 (2004).

"Long-Range Molecular Resonances in a Cold Rydberg Gas," S.M. Farooqi, D. Tong, S. Krishnan, J. Stanojevic, Y.P. Zhang, J.R. Ensher, A.S. Estrin, C. Boisseau, R. Cote, E.E. Eyler, and P.L. Gould, Phys. Rev. Lett. **91**, 183002 (2003).

"Predissociations in 0_u^+ and 1_g States of K_2", T. Bergeman, P.S. Julienne, C.J. Williams, E. Tiesinga, M. Riad Manaa, H. Wang, P.L. Gould, and W.C. Stwalley, J. Chem. Phys. **117**, 7491 (2002).

"A Frequency-Modulated Injection-Locked Diode Laser for Two-Frequency Generation," R. Kowalski, S. Root, S.D. Gensemer, and P.L. Gould, Rev. Sci. Instrum. **72**, 2532 (2001).

"Ultracold Plasmas Come of Age," P.L. Gould and E.E. Eyler, Phys. World **14** (no. 3), 19 (2001).

"Measurement of the Rb($5D_{5/2}$) Photoionization Cross Section Using Trapped Atoms," B.C. Duncan, V. Sanchez-Villicana, P.L. Gould, and H. Sadeghpour, Phys. Rev. A **63**, 043411 (2001).

"Ground-State Scattering Lengths for Potassium Isotopes Determined by Double-Resonance Photoassociative Spectroscopy," H. Wang, A.N. Nikolov, J.R. Ensher, P.L. Gould, E.E. Eyler, W.C. Stwalley, J.P. Burke, Jr., J.L. Bohn, C.H. Greene, E. Tiesinga, C.J. Williams, and P.S. Julienne, Phys. Rev. A **62**, 052704 (2000).

"Ultracold ^{87}Rb Ground-State Hyperfine-Changing Collisions in the Presence and Absence of Laser Light," S.D. Gensemer, P.L. Gould, P.J. Leo, E. Tiesinga, and C.J. Williams, Phys. Rev. A 62, 030702(R) (2000).

"Efficient Production of Ground-State Potassium Molecules at sub-mK Temperatures by Two-Step Photoassociation," A.N. Nikolov, J.R. Ensher, E.E. Eyler, H. Wang, W.C. Stwalley, and P.L. Gould, Phys. Rev. Lett. **84**, 246 (2000).

"Determination of the Scattering Lengths of ^{39}K from 1_u Photoassociation Lineshapes," C.J. Williams, E. Tiesinga, P.S. Julienne, H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **60**, 4427 (1999).

"Determination of ^{39}K Scattering Lengths Using Photoassociation Spectroscopy of the 0_g^- State," J.P. Burke, Jr., C.H. Greene, J.L. Bohn, H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **60**, 4417 (1999).

"Formation of Cold (T<1K) Molecules," J.T. Bahns, P.L. Gould, and W.C. Stwalley, Adv. At. Mol. Opt. Phys. **42**, 171 (2000).

"Collisional Properties of Ultracold Potassium: Consequences for Degenerate Bose and Fermi Gases," J.L. Bohn, J.P. Burke, Jr., C.H. Greene, H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **59**, 3660 (1999).

"Observation of Ultracold Ground-State Potassium Molecules," A.N. Nikolov, E.E. Eyler, X.T. Wang, J. Li, H. Wang, W.C. Stwalley, and P.L. Gould, Phys. Rev. Lett. **82**, 703 (1999).

"Observation of the Pure Long-Range 1_u State of an Alkali Dimer by Photoassociative Spectroscopy," X. Wang, H. Wang, P.L. Gould, W.C. Stwalley, E. Tiesinga, and P.S. Julienne, Phys. Rev. A **57**, 4600 (1998).

"Ultracold Collisions Observed in Real Time," S.D. Gensemer and P.L. Gould, Phys. Rev. Lett. **80**, 936 (1998).

"Fine-Structure Predissociation of Ultracold Photoassociated $^{39}K_2$ Molecules Observed by Fragmentation Spectroscopy," H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. Lett. **80**, 476 (1998).

"Laser Cooling of Atoms to the Doppler Limit," P.L. Gould, Am. J. Phys. **65**, 1120 (1997).

"Trap-Loss Collisions of ^{85}Rb and ^{87}Rb: Dependence on Trap Parameters," S.D. Gensemer, V. Sanchez-Villicana, K.Y.N. Tan, T.T. Grove, and P.L. Gould, Phys. Rev. A **56**, 4055 (1997).

"Optical-Optical Double Resonance Photoassociative Spectroscopy of Ultracold ^{39}K Atoms Near Highly-Excited Asymptotes," H. Wang, X.T. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. Lett. **78**, 4173 (1997).

"The Long-Range Interaction of the ^{39}K(4s) + ^{39}K(4p) Asymptote Inferred from the 0_g^- Pure Long-Range State by Photoassociative Spectroscopy," H. Wang, P.L. Gould, and W.C. Stwalley, J. Chem. Phys. **106**, 7899 (1997).

"Efficient 5D Excitation of Trapped Rb Atoms Using Pulses of Diode Laser Light in the Counterintuitive Order," W. Süptitz, B.C. Duncan, and P.L. Gould, J. Opt. Soc. Am. B **14**, 1001 (1997).

"Precise Determination of the Dipole Matrix Element and Radiative Lifetime of the ^{39}K 4p State by Photoassociative Spectroscopy," H. Wang, J. Li, X.T. Wang, C.J. Williams, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **55**, R1569 (1997).

"Observation of Flux Enhancement in Collisions between Ultracold Atoms," V. Sanchez-Villicana, S.D. Gensemer, and P.L. Gould, Phys. Rev. A **54**, R3730 (1996).

"Direct Measurement of the Ground-State Dissociation Energy of Na_2", K.M. Jones, S. Maleki, S. Bize, P.D. Lett, C.J. Williams, H. Richling, H. Knöckel, E. Tiemann, H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **54**, R1006 (1996).

"Laser Cooling of Molecules: A Sequential Scheme for Rotation, Translation, and Vibration," J.T. Bahns, W.C. Stwalley, and P.L. Gould, J. Chem. Phys. **104**, 9689 (1996).

"Photoassociative Spectroscopy of Pure Long-Range Molecules," H. Wang, P.L. Gould, and W.C. Stwalley, Z. Phys. D **36**, 317 (1996).

"Photoassociative Spectroscopy of Ultracold ^{39}K Atoms in a High-Density Vapor-Cell Magneto-Optical Trap," H. Wang, P.L. Gould, and W.C. Stwalley, Phys. Rev. A **53**, R1216 (1996).

"Resolved-Sideband Raman Cooling of a Bound Atom to the Zero-Point Energy," C. Monroe, D.M. Meekhof, B.E. King, S.R. Jefferts, W.M. Itano, D.J. Wineland, and P.L. Gould, Phys. Rev. Lett. **75**, 4011 (1995).

"Cooling and Trapping of Three-Level Atoms in a Bichromatic Standing Wave," H. Pu, T. Cai, N.P. Bigelow, T.T. Grove, and P.L. Gould, Opt. Commun. **118**, 261 (1995).

"Observation of Three-Level Rectified Dipole Forces Acting on Trapped Atoms," T.T. Grove, B.C. Duncan, V. Sanchez-Villicana, and P.L. Gould, Phys. Rev. A **51**, R4325 (1995).

"Suppression of Ultracold Ground-State Hyperfine-Changing Collisions with Laser Light," V. Sanchez-Villicana, S.D. Gensemer, K.Y.N. Tan, A. Kumarakrishnan, T.P. Dinneen, W. Süptitz, and P.L. Gould, Phys. Rev. Lett. **74**, 4619 (1995).

"Two-Photon Two-Color Diode Laser Spectroscopy of the Rb $5D_{5/2}$ State," T.T. Grove, V. Sanchez-Villicana, B.C. Duncan, S. Maleki, and P.L. Gould, Physica Scripta **52**, 271 (1995).

"Suppression of Trap Loss Collisions at Low Temperature," C.D. Wallace, V. Sanchez-Villicana, T.P. Dinneen, and P.L. Gould, Phys. Rev. Lett. **74**, 1087 (1995).

"Hyperfine Structure Modifications of Collisional Losses from Light-Force Atom Traps," P.D. Lett, K. Molmer, S.D. Gensemer, K.Y.N. Tan, C.D. Wallace, and P.L. Gould, J. Phys. B **28**, 65 (1995).

"Rectified Forces on a Three-Level Atom: The Cascade Configuration," T.T. Grove and P.L. Gould, Laser Phys. **4**, 957 (1994).

"Diffraction of Atoms by Light," P.L. Gould, Am. J. Phys. **62**, 1046 (1994).

"Measurements of Temperature and Spring Constant in a Magneto-Optical Trap," C.D. Wallace, T.P. Dinneen, K.Y.N. Tan, A. Kumarakrishnan, P.L. Gould, and J. Javanainen, J. Opt. Soc. Am. B **11**, 703 (1994).

"Use of Trapped Atoms to Measure Absolute Photoionization Cross Sections," T.P. Dinneen, C.D. Wallace, K.Y.N. Tan, and P.L. Gould, Opt. Lett. **17**, 1706 (1992).

"Narrow Linewidth, Highly Stable, Tunable Diode Laser System," T.P. Dinneen, C.D. Wallace, and P.L. Gould, Opt. Commun. **92**, 277 (1992).

"Isotopic Difference in Trap Loss Collisions of Laser Cooled Rubidium Atoms," C.D. Wallace, T.P. Dinneen, K.Y.N. Tan, T.T. Grove, and P.L. Gould, Phys. Rev. Lett. **69**, 897 (1992).

"Laser Modification of Ultracold Collisions: Experiment," P.D. Lett, P.S. Jessen, W.D. Phillips, S.L. Rolston, C.I. Westbrook, and P.L. Gould, Phys. Rev. Lett. **67**, 2139 (1991).

"Momentum Transfer to Atoms by a Standing Light Wave: Transition from Diffraction to Diffusion," P.L. Gould, P.J. Martin, G.A. Ruff, R.E. Stoner, J.-L. Pique, and D.E. Pritchard, Phys. Rev. A **43**, 585 (1991).

"Laser Focusing of Atomic Beams," G.M. Gallatin and P.L. Gould, J. Opt. Soc. Am. B **8**, 502 (1991).

"Experimental Study of Sub-Poissonian Statistics in the Transfer of Momentum from Light to Atoms," B.G. Oldaker, P.J. Martin, P.L. Gould, M. Xiao, and D.E. Pritchard, Phys. Rev. Lett. **65**, 1555 (1990).

"Localization of Atoms in a Three-Dimensional Standing Wave," C.I. Westbrook, R.N. Watts, C.E. Tanner, S.L. Rolston, W.D. Phillips, P.D. Lett, and P.L. Gould, Phys. Rev. Lett. **65**, 33 (1990). [and Reply to Comment, Phys. Rev. Lett. 66, 2413 (1991)]

"Linear Intensity Dependence of a Two-Photon Transition Rate," J. Javanainen and P.L. Gould, Phys. Rev. A **41**, 5088 (1990).

"Observation of Atoms Laser Cooled Below the Doppler Limit," P.D. Lett, R.N. Watts, C.I. Westbrook, W.D. Phillips, P.L. Gould, and H.J. Metcalf, Phys. Rev. Lett. **61**, 169 (1988).

"Observation of Associative Ionization of Ultra-Cold Laser Trapped Sodium Atoms," P.L. Gould, P.D. Lett, P.S. Julienne, W.D. Phillips, H.R. Thorsheim, and J. Weiner, Phys. Rev. Lett. **60**, 788 (1988).

"Cooling, Stopping, and Trapping Atoms," W.D. Phillips, P.L. Gould, and P.D. Lett, Science **239**, 877 (1988).

"Diffraction of Atoms Moving Through a Standing Light Wave," P.J. Martin, P.L. Gould, B.G. Oldaker, A.H. Miklich, and D.E. Pritchard, Phys. Rev. A **36**, 2495 (1987).

"Preparation of a Single-State Atomic Beam by Optical Pumping and Radiative Deflection," P.L. Gould, G.A. Ruff, P.J. Martin, and D.E. Pritchard, Phys. Rev. A **36**, 1478 (1987).

"Diffraction of Atoms by Light: The Near-Resonant Kapitza-Dirac Effect," P.L. Gould, G.A. Ruff, and D.E. Pritchard, Phys. Rev. Lett. **56**, 827 (1986).

"Experimental Possibilities for Observation of Unidirectional Momentum Transfer to Atoms from Standing-Wave Light," D.E. Pritchard and P.L. Gould, J. Opt. Soc. Am. B **2**, 1799 (1985).

"Deflection of Atoms by Standing-Wave Radiation," P.E. Moskowitz, P.L. Gould, and D.E. Pritchard, J. Opt. Soc. Am. B **2**, 1784 (1985).

"Diffraction of an Atomic Beam by Standing-Wave Radiation," P.E. Moskowitz, P.L. Gould, S.R. Atlas, and D.E. Pritchard, Phys. Rev. Lett. **51**, 370 (1983).

<u>Conference Proceedings</u>

"Ultracold Rydberg Gases and Plasmas," P.L. Gould, S.M. Farooqi, S. Krishnan, J. Stanojevic, D. Tong, Y.P Zhang, J.R. Ensher, A. Estrin, C.-H. Cheng, and E.E. Eyler, in **Interactions in Ultracold Gases: From Atoms to Molecules**, edited by M. Weidemüller and C. Zimmerman (Wiley-VCH, Weinheim, 2003), p. 270.

"Efficient Production of Ultracold Ground-State Potassium Molecules," E.E. Eyler, A.N. Nikolov, J.R. Ensher, H. Wang, W.C. Stwalley, and P.L. Gould, in **Laser Spectroscopy XIV**, edited by R. Blatt, J. Eschner, D. Leibfried, and F. Schmidt-Kaler (World Scientific, Singapore, 2000), p. 326.

"Atoms Interacting with Standing Light Waves: Diffraction, Diffusion and Rectification," P.L. Gould and D.E. Pritchard, in **Coherent and Collective Interactions of Particles and Radiation Beams**, Proceedings of the International School of Physics "Enrico Fermi", Course CXXXI, July 11-21, 1995, Varenna, Italy, edited by A. Aspect, W. Barletta, and R. Bonifacio, (IOS Press, Amsterdam, 1996), p. 443-480.

"Concepts for the Efficient Production and Storage of Antimatter," B. Cassenti, P. Mannheim, and P. Gould, AIAA Paper No. 93-2031, 1993.

"Ultra-cold Collisions of Laser Trapped Rubidium," C.D. Wallace, T.P. Dinneen, K.Y.N. Tan, and P.L. Gould, Proceedings of the Symposium on Cold Atom Collisions, Cambridge, Massachusetts, April 26-28, 1992.

"Laser Modification of Ultracold Collisions," C. Westbrook, P. Lett, R. Heather, P. Jessen, P. Julienne, W. Phillips, S. Rolston, and P.L. Gould, in **Tenth International Conference on Laser Spectroscopy**, edited by M. Ducloy, E. Giacobinao, and G. Camy (World Scientific, Singapore, 1991), p. 45.

"Laser Lenses for Neutral Atomic Beams," G.M. Gallatin and P.L. Gould, Proceedings of the SPIE Annual Meeting, San Diego, CA, June, 1990.

"Ultracold Collisions: Associative Ionization in a Laser Trap," P. Lett, P. Jessen, C. Westbrook, S. Rolston, W. Phillips, P. Julienne, and P. Gould, Proceedings of the International Workshop on Light Induced Kinetic Effects on Atoms, Ions and Molecules, Elba, Italy, May 2-5, 1990.

"Rectification of the Light Pressure Force Acting on a Three-State Atom," J. Javanainen and P.L. Gould, in **Coherence and Quantum Optics VI**, L. Mandel and E. Wolf, editors (Plenum, New York, 1989), p. 565.

"Heterodyne Spectrum of the Fluorescence from Optical Molasses," P.D. Lett, C.I. Westbrook, R.N. Watts, S.L. Rolston, C.E. Tanner, W.D. Phillips, and P.L. Gould, in **Coherence and Quantum Optics VI**, L. Mandel and E. Wolf, editors (Plenum, New York, 1989), p. 681.

"Two-Photon Transition Driven by Parametrically Down-Converted Light: A Linear Intensity Dependence," P.L. Gould and J. Javanainen, in **Coherence and Quantum Optics VI**, L. Mandel and E. Wolf, editors (Plenum, New York, 1989), p. 437.

"A Heterodyne Spectrum of the Fluorescence Spectrum of Optical Molasses," W.D. Phillips, C.I. Westbrook, R.N. Watts, S.L. Rolston, C.E. Tanner, P.D. Lett, and P.L. Gould, in **Laser Spectroscopy IX**, M.S. Feld, A. Mooradian, and J.E. Thomas, editors (Academic Press, San Diego, 1989), p. 8.

"Atoms Laser-Cooled Below the Doppler Limit," P. Lett, C. Westbrook, R. Watts, S. Rolston, P. Gould, H. Metcalf, and W. Phillips, in **Frequency Standards and Metrology**, A. De Marchi, editor (Springer-Verlag, Berlin, 1989), p. 264.

"Associative Ionization of Ultra-Cold Laser Trapped Sodium Atoms," P.L. Gould, P.D. Lett, R.N. Watts, C.I. Westbrook, P.S. Julienne, W.D. Phillips, H.R. Thorsheim, and J. Weiner, in **Atomic Physics 11**, S. Haroche, J.C. Gay, and G. Grynberg, editors (World Scientific, Singapore, 1989), p. 215.

"Observation of Atoms Laser Cooled Below the Doppler Limit," W.D. Phillips, C.I. Westbrook, P.D. Lett, R.N. Watts, P.L. Gould, and H.J. Metcalf, in **Atomic Physics 11**, S. Haroche, J.C. Gay, and G. Grynberg, editors (World Scientific, Singapore, 1989), p. 633.

"Observation of Associative Ionization of Ultra-Cold Laser Trapped Sodium Atoms," P.L. Gould, P.D. Lett, W.D. Phillips, P.S. Julienne, H.R. Thorsheim, and J. Weiner, in **Advances in Laser Science III**, A.C. Tam, J.L. Gole, and W.C. Stwalley, editors, AIP Conf. Proc. No. 172 (AIP, New York, 1988), p. 295.

"Prospects for Electromagnetic Manipulation and Trapping of Antihydrogen," P.D. Lett, P.L. Gould, and W.D. Phillips, Hyperfine Interactions **44**, 335 (1988) (Special Issue: Proceedings of Antimatter '87, Karlsruhe, Germany, Nov. 30 - Dec. 2, 1987).

"New Measurements with Optical Molasses," P.L. Gould, P.D. Lett, and W.D. Phillips, in **Laser Spectroscopy VIII**, S. Svanberg and W. Persson, editors (Springer-Verlag, Berlin, 1988), p. 64.

"Diffraction of Atoms from a Standing Light Wave," P.J. Martin, P.L. Gould, B.G. Oldaker, A.H. Miklich, and D.E. Pritchard, Physica B **151**, 255 (1988) (Special Issue: Proceedings of the International Workshop on Matter Wave Interferometry in the Light of Schrodinger's Wave Mechanics, Vienna, Austria, Sept. 14-16, 1987).

"Electromagnetic Manipulation of Atomic Hydrogen," W.D. Phillips, P.L. Gould, and P.D. Lett, Proceedings of the Cooling, Condensation and Storage of Hydrogen Cluster Ions Workshop (Jan. 1987), Univ. of Dayton Spec. Publ., J.T. Bahns, editor, p. 159.

"Switching Characteristics and Threshold Properties of Electrically Switched Nematic Liquid Crystal Bistable Configuration Devices," J. Cheng, G.D. Boyd, P.L. Gould, and F.G. Storz, Proceedings of the Biennial Display Research Conference, Cherry Hill, NJ, Oct. 21-23, 1980.

<u>Other Contributions</u>

"Ultracold Collisions," P.L. Gould, in **McGraw-Hill Yearbook of Science and Technology, 2003**, p. 445 (McGraw-Hill, New York, 2003).