

Michael W. Noel

Bryn Mawr College, Department of Physics, 101 North Merion Avenue, Bryn Mawr, PA 19010
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Education

University of Rochester, The Institute of Optics, Rochester, NY

Ph. D. in Optics, February 1996

Thesis: "Atomic Electron Wave Packet Interference and Control"

Advisor: Carlos R. Stroud, Jr.

M. S. in Optics, February 1991

Whitworth College, Spokane, WA

B. S. in Physics, May 1988

B. A. in Mathematics, May 1988

Graduated summa cum laude

Experience

Associate Professor, Department of Physics, Bryn Mawr College, Bryn Mawr, PA 19010
September 2006 – present

Assistant Professor, Department of Physics, Bryn Mawr College, Bryn Mawr, PA 19010
September 2000 – August 2006

Research Interests:

Laser cooling and trapping, resonant dipole-dipole interactions, low temperature plasma physics, many body interactions, quantum computing, and quantum control.

Grants Funded:

The National Science Foundation grant No. 1126656, "MRI: Acquisition of a UHV multi-source sputtering system for multidisciplinary material research," 2011-2012, \$239,550.

The National Science Foundation grant No. 0653544, "Collaborative Proposal: CCLI Phase II: Diverse Partnership for Teaching Quantum Mechanics and Modern Physics with Photon Counting Instrumentation," 2009-2013, \$500,000 total, \$12,600 for BMC contribution.

The National Science Foundation grant No. 0653544, "Engineered samples of Ultracold Rydberg Atoms," 2007-2011, \$300,000.

The National Science Foundation grant No. 0134676, "Career: Rydberg Atom Crystals," 2002-2007, \$400,629 (a \$5,000 REU supplement to this grant was funded in June 2005).

New York State Section of the American Physical Society and the American Association of Physics Teachers Physics Outreach Grant, "Ball of Physics," 2005-2006, \$2,200.

Grants Under Review:

The National Science Foundation proposal No. 1205895, "Collaborative Research: Coherent Control of Interactions among Ultracold Rydberg Atoms," submitted October 2011, requested term 2012-2015, requested budget \$500,000 total, \$350,000 for BMC and \$150,000 for Ursinus College.

Courses Taught:

Physics 101 – Introductory Physics I

Physics 102 – Introductory Physics II

Physics 104 – Foundations of Physics II

Physics 109 – How Things Work
Physics 122 – Classical Mechanics
Physics 201 – Electromagnetism and Physical Optics
Physics 214 – Modern Physics and Quantum Mechanics
Physics 306 – Mathematical Methods in the Physical Sciences
Physics 309 – Advanced Electromagnetic Theory
Physics 331 – Advanced Modern Physics Laboratory
Physics 403 – Supervised Research
Physics 701 – Unit of Supervised Work

Outreach:

The *Ball of Physics* outreach program provides demonstration shows both on campus and at local elementary and middle schools and is designed to spark interest in science for young audiences.

Undergraduate Students Supervised:

Emily Altieri, A.B. May 2010 with honors
Senior Thesis: *A new MOT using coated windows for the excitation of a single Rydberg atom*
Bonnie Schmittberger, A.B. May 2010 with honors
Senior Thesis: *A New Laser System for the Excitation of Rydberg States in Rb*
Laura Popa, A.B. May 2009 with honors, Elizabeth S. Shippen Scholarship in Science 2008, Gertrude Slaughter Fellowship 2009
Senior Thesis: *Excitation of Cold Rydberg Atoms in a New Magneto-Optical Trap*
Rohini Kamal, A.B. May 2008 with honors
Senior Thesis: *Exciting Rydberg States of Rubidium Atoms*
Laura Gudorf, A.B. May 2008
Summer Research Project: *Excitation of Potassium with a Blue Diode Laser*
Rebecca Pouy, A.B. May 2006
Senior Thesis: *Construction of a dye laser for excitation of trapped rubidium*
Mary Lyon, A.B. May 2006 with honors
Senior Thesis: *Far off Resonance Trapping*
Aditi Vashist, summer 2005
Summer Project: *Far off Resonance Trapping*
Maeve O'Hara, summer 2005
Summer Project: *Interactive Demonstrations for the Ball of Physics*
Cordelia Ochis, summer 2005
Summer Project: *Dipole-Dipole Interactions in a Reduced Dimensionality Frozen Rydberg Gas*
Charles Collett, summer 2005
Summer Project: *Far off Resonance Trapping*
Sebastian Mankowski, B.A. May 2005 at Haverford College,
Senior Thesis: *Construction of a magneto-optical trap*
Shubha Sunder, A.B. May 2005 with honors, Marshall Fellow
Senior Thesis: *Many-Body Effects in a Frozen Rydberg Gas*
Flora Shepherd, summer 2003
Summer Project: *Development of a physics outreach program, Ball of Physics*
Mary Kutteruf, A.B. May 2003, Marshall Fellow
Senior Thesis: *Exciting Lithium Atoms to Rydberg states*
Ekua Anane-Fenin, summer 2002
Summer Research Project: *Computer Interfacing for Data Acquisition and Control*
Anne Goodsell, A.B. May 2002 with honors, Marshall Fellow,
Senior Thesis: *Atom Trapping – Stable Operation and Trap Characterization*
Ellen Kruger, A.B. May 2002
Senior Thesis: *Construction of a Diode Laser for Far-Off Resonance Trapping*
Katharine Claringbould, A.B. May 2001 with honors
Senior Thesis: *Construction of a Magneto-optical Trap for Laser Cooling and Trapping*

Graduate Students Supervised:

Donald Fahey, 2009 – present
Thomas Carroll, PhD May 2006,
Thesis: *Controllable Rydberg Atom Interactions in a Magneto-Optical Trap*
Ahmed Rashed, M.S. May 2004,
Thesis: *Generating Half-Cycle Electrical Pulses with Infrared Light*

Postdoctoral Research Associates Supervised:

Thomas Carroll, June 2006 – September 2006
Thomas is currently an assistant Professor at Ursinus College
Michael Lim, September 2002 – July 2003,
Michael is now an assistant professor at Rowan University

College Service:

Committee on Laboratories, 2011 – present
Search Committee for an Assistant Professor of Chemistry at Bryn Mawr College, 2011 – 2012
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2010 – 2011
Chairman of the Department of Physics, 2007 – 2010
Committee on Academic Priorities, 2007 – 2010
Chairman of the Search Committee for an Assistant Professor of Physics at BMC, 2008 – 2009
Task Force on Balancing Mission and Resources, 2007 – 2008
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2006 – 2007
Search Committee for an Assistant Professor of Physics at Haverford College, 2005 – 2006
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2004 – 2005
Search Committee for a Postdoctoral Fellow supported by the HHMI, 2005
Graduate Council, 2005 – 2008
Undergraduate Council, 2004 – 2007
Committee on Academic Computing, 2001 – 2003
Committee on Laboratories, 2001 – 2002
Library and Information Technology Advisory Group, 2002 – 2003
Faculty Steering Committee for the Sciences Library and Computing Node, 2000 – 3 (Chair 2001 – 3)
Search Committee for the Science Unix system administrator for the sciences, 2002

Professional Service:

Referee for *Physical Review Letters*
Referee for *The American Journal of Physics*
Referee for the *European Physical Journal D*
Reviewer for *The Research Corporation*
Reviewer for *The National Science Foundation*

Workshops:

Encouraging and Responding to Student Writing in Quantitatively Demanding Disciplines, Bryn Mawr College, June 2005.
Math Science Pedagogy Seminar, Bryn Mawr College, Sponsored by the Math Science Partnership of Greater Philadelphia, 2004-2005.
Integrating Research into Undergraduate Education: The Value Added, Washington D.C., November 2004.
Workshop on Physics on the Road, University of Colorado, February 2003.
Workshop for New Physics and Astronomy Faculty sponsored by the American Association of Physics Teachers, American Astronomical Society, and American Physical Society and funded by the National Science Foundation, Washington D.C., November 2002.

Instructor, Department of Physics, University of Virginia, Charlottesville, VA 22901
September 1999 – May 2000

PHYS 105, How Things Work I, and PHYS 106, How Things Work II. These undergraduate courses in physics for non-science majors were team taught with Professor Lou Bloomfield. General information on How Things Work can be found at <http://howthingswork.virginia.edu>.

Postdoctoral research, Department of Physics, University of Virginia, Charlottesville, VA 22901

March 1996 – July 2000

Supervisor: Professor Thomas F. Gallagher

Research Experience: Microwave ionization, strong field – atom interactions, quantum chaos, quantum control, two-level atoms, resonant dipole-dipole interactions, low temperature plasma physics, and laser cooling and trapping.

Lecturer, Los Alamos National Laboratory

May 26 - June 4, 1998

Conference Experience for Undergraduates. This was a program sponsored by Los Alamos National Laboratory and The University of New Mexico at which I gave lectures on wave packets and quantum control to junior and senior undergraduates who were considering graduate school.

Visiting Scientist, *Fundamenteel Onderzoek der Materie*, Amsterdam

October 1997

I was a visiting fellow in the laboratory of L. D. Noordam. While I was there I worked on an experiment to study the time resolved electron emission of field induced rotational autoionization of NO Rydberg states using the atomic streak camera that was developed in his lab.

Graduate Research, The Institute of Optics, University of Rochester, Rochester, NY 14627

Radial Wave Packet, Experiment: For my dissertation research I used trains of ultrafast (mode-locked) laser pulses to excite atomic electrons into coherent superpositions of radially localized wave packets in a series of experiments designed to emphasize and utilize the wave aspects of these packets. This work was reviewed in several popular science magazines: Scientific American, p. 124, June (1997); The New York Times, p. C1, August 15 (1995); Science News, **148**, 440 (1995) as one of eight in Physics of the Year; Scientific American, p. 40, October (1995); Optics and Photonics News **6**, 33 (1995), in the review of Optics in 1995; Science, **269**, 636 (1995); Physics Today, p. 9, September (1995); and several others.

Classical Limit of an Atom, Theory: I was also involved in a theoretical project in which we developed a method to excite the classical-limit state of an atom, the circular-orbit wave packet. Reviews of this work have appeared in Nature, **370**, 593 (1994) and Science News, **146**, 175 (1994).

Honors and Affiliations

National Science Foundation Career Award

Finalist for The American Physical Society's award for outstanding doctoral thesis research in atomic, molecular, and optical physics

University Research Initiative Fellowship (merit-based graduate fellowship)

Erickson Scholarship (one-year undergraduate scholarship for physics majors)

Member, Optical Society of America

Member, American Physical Society

Member, American Association of Physics Teachers

Publications

- [24] Emily Altieri, Donald P. Fahey, Michael W. Noel, Rachel J. Smith, and Thomas J. Carroll, "A systematic study of the dipole-dipole interaction among rubidium Rydberg atoms," Submitted to Phys. Rev. A, 10 June 2011.
- [23] Donald P. Fahey and Michael W. Noel, "Excitation of Rydberg states in rubidium with near infrared diode lasers," Opt. Express **19**, 17002 (2011).
- [22] Thomas J. Carroll, Christopher Daniel, Lea Hoover, Timothy Sidie, and Michael W. Noel, "Simulations of the dipole-dipole interaction between two spatially separated groups of Rydberg atoms," Phys. Rev. A **80**, 052712 (2009).
- [21] Thomas J. Carroll, Cordelia Ochis, Peter D. Maenner, and Michael W. Noel, "Time Dependence of the Many-Body Interactions in a One-Dimensional Sample of Ultracold Rydberg Atoms," *Coherence and Quantum Optics IX*, edited by N. P. Bigelow, J. H. Eberly, and C. R. Stroud, Jr. (Optical Society of America 2008), p. 527.
- [20] Thomas J. Carroll, Shubha Sunder, and Michael W. Noel, "Many-Body Interactions in a Sample of Ultracold Rydberg Atoms with Varying Dimensions and Densities," Phys. Rev. A, **73**, 032725 (2006).

- [19] Thomas J. Carroll, Katharine Claringbould, Anne Goodsell, M. J. Lim, and Michael W. Noel, “Angular Dependence of the Dipole-Dipole Interaction in a Nearly One-Dimensional Sample of Rydberg Atoms,” *Phys. Rev. Lett.* **93**, 153001 (2004).
- [18] Wenhui Li, Michael W. Noel, Michael P. Robinson, Paul J. Tanner, Thomas F. Gallagher, Daniel Comparat, Bruno Laburthe Tolra, Nicolas Vanhaecke, Thibault Vogt, Nassim Zahzam, Pierre Pillet, and Duncan A. Tate, “Evolution dynamics of a dense frozen Rydberg gas to plasma,” *Phys. Rev. A*, **70**, 042713 (2004).
- [17] Wenhui Li, I. Mourachko, Michael W. Noel and T. F. Gallagher, “Millimeter-Wave Spectroscopy of Cold Rb Rydberg Atoms in a Magneto-Optical Trap: Quantum Defects of the ns, np, and nd series,” *Phys. Rev. A*, **67**, 052502 (2003).
- [16] T. F. Gallagher, P. Pillet, M. P. Robinson, B. Laburthe-Tolra, and Michael W. Noel, “Back and Forth between Rydberg Atoms and Ultracold Plasmas,” *J. Opt. Soc. Am. B*, **20**, 1091 (2003).
- [15] J. Lambert, Michael W. Noel, and T. F. Gallagher, “Rydberg-atom population transfer by population trapping in a chirped microwave pulse,” *Phys. Rev. A*, **66**, 053413 (2002).
- [14] T. F. Gallagher, M. P. Robinson, B. Laburthe-Tolra, Michael W. Noel, and P. Pillet, “Evolution of Cold Rydberg Atoms into an Ultracold Plasma,” *Atomic Processes in Plasmas: 13th APS Topical Conference*, Edited by D. R. Schultz et al. (American Institute of Physics, 2002), p. 22.
- [13] Michael W. Noel, Lung Ko, and T. F. Gallagher, “Microwave Ionization of an Atomic Electron Wave Packet,” *Phys. Rev. Lett.* **87**, 043001 (2001).
- [12] M. P. Robinson, B. Laburthe Tolra, Michael W. Noel, T. F. Gallagher, and P. Pillet, “Spontaneous Evolution of Rydberg Atoms into an Ultracold Plasma,” *Phys. Rev. Lett.* **85**, 4466 (2000).
- [11] Michael W. Noel, W. M. Griffith, and T. F. Gallagher, “Classical subharmonic resonances in microwave ionization of lithium Rydberg atoms,” *Phys. Rev. A*, **62**, 063401 (2000).
- [10] Michael W. Noel, W. M. Griffith, and T. F. Gallagher, “Population Trapping in Extremely Highly Excited States in Microwave Ionization,” *Phys. Rev. Lett.* **83**, 1747 (1999).
- [9] Lung Ko, Michael W. Noel, Jonathan Lambert, and T. F. Gallagher, “Two-Mode Multiphoton Transitions,” *J. Phys. B: At. Mol. Opt. Phys.* **32**, 3469 (1999).
- [8] Michael W. Noel, W. M. Griffith, and T. F. Gallagher, “Frequency Modulated Excitation of a Two-Level Atom,” *Phys. Rev. A* **58**, 2265 (1998).
- [7] W. M. Griffith, Michael W. Noel, and T. F. Gallagher, “Phase and Risetime Dependence Using RF Pulses in Multiphoton Processes,” *Phys. Rev. A* **57**, 3698 (1998).
- [6] Michael W. Noel and C. R. Stroud, Jr., “Shaping an atomic electron wave packet,” *Optics Express* **1**, 176 (1997).
- [5] Michael W. Noel and C. R. Stroud, Jr., “Excitation of an Atomic Electron to a Coherent Superposition of Macroscopically Distinct States,” *Phys. Rev. Lett.* **77**, 1913 (1996).
- [4] Michael W. Noel and C. R. Stroud, Jr., “Young’s double-slit interferometry within an atom,” *Phys. Rev. Lett.* **75**, 1252 (1995).
- [3] Michael W. Noel and C. R. Stroud, Jr., “A radial wave packet Schrödinger cat state,” *Coherence and Quantum Optics VII*, edited by Joseph H. Eberly, Leonard Mandel, and Emil Wolf (Plenum, New York 1996), p. 563.
- [2] Z. D. Gaeta, Michael W. Noel, and C. R. Stroud, Jr., “Excitation of the classical-limit state of an atom,” *Phys. Rev. Lett.* **73**, 636 (1994).
- [1] Stephen H. Chakmakjian, Stephanos Papademetriou, Karl Koch, Michael W. Noel, and C. R. Stroud, Jr., “Near threshold behavior of multimode cw dye lasers with an amplitude modulated pump,” *Coherence and Quantum Optics VI*, edited by Joseph H. Eberly, Leonard Mandel, and Emil Wolf (Plenum, New York 1989), p. 137.

Invited Presentations

Michael W. Noel, “Resonant Energy Exchange Among Cold Rydberg Atoms,” International Workshop on Ultracold Rydberg Physics, Recife, Brazil, November (2010).

Michael W. Noel, “Resonant Energy Exchange Among Ultracold Highly-Excited Atoms,” Colloquium, University of Connecticut, March (2007).

Michael W. Noel, “Manipulating Many-Body Interactions in a Sample of Ultracold Rydberg Atoms,” International Workshop on Correlated and Many-Body Phenomena in Dipolar Systems, Dresden, Germany, May (2006).

Michael W. Noel, “Many-Body Interactions in a Restricted Dimensionality Sample of Ultracold Rydberg Atoms,” Colloquium, Temple University, January (2006).

Michael W. Noel, “Research with Cold Atoms and Outreach with Cool Demonstrations,” Parents Weekend, Bryn Mawr College, November (2005).

Michael W. Noel, “Many-Body Interactions in a Restricted Dimensionality Sample of Ultracold Rydberg Atoms,” Laser Science XXI, Tucson, Arizona, October (2005).

Michael W. Noel, “Laser Cooling,” Society of Physics Students Zone meeting, Rowan University, April (2004).

Michael W. Noel, “Ultracold Plasmas” and “Rydberg Atom Crystals: A New Type of Designer Solid,” Two research seminars, Oregon State University, March (2004).

Michael W. Noel, “Resonant Interactions in a Frozen Gas of Highly-Excited Atoms,” Research seminar, Millersville University, February (2004).

Michael W. Noel, “Rydberg Atom Crystals: A New Type of Designer Solid,” Research seminar, Carleton College, January (2004).

Michael W. Noel, “Rydberg Atom Crystals: A New Type of Designer Solid,” Research seminar, Franklin and Marshall College, December (2003).

Michael W. Noel, “Controlling Resonant Interactions in a Frozen Gas of Highly-Excited Atoms,” Research seminar, Villanova University, October (2003).

Michael W. Noel, “Resonant Interactions in a Frozen Gas of Highly-Excited Atoms,” Research seminar, Smith College, February (2003).

Michael W. Noel, “Ultracold Highly-Excited Atoms: A New Type of Designer Solid,” Research seminar, Colgate University, January (2003).

Michael W. Noel, “Resonant Interactions between Ultracold Highly-Excited Atoms,” Research seminar, Wesleyan University, November (2002).

Michael W. Noel, “Ionization and Excitation of Highly Excited Atoms by Short Microwave Pulses,” Research seminar, Bryn Mawr College, February (2000).

Michael W. Noel, Lung Ko, and T. F. Gallagher, “Phase and frequency dependence of Rydberg wave packet ionization with few-cycle pulses,” OSA Annual Meeting, paper MP2 (Invited), Santa Clara, California, September (1999).

Michael W. Noel, “Ionization and Excitation of Highly Excited Atoms by Short Microwave Pulses,” Research seminar, The Ohio State University, March (1999).

Michael W. Noel, “Ionization and Excitation of Highly Excited Atoms by Short Microwave Pulses,” Research seminar, University of Delaware, February (1999).

Michael W. Noel, “Microwave excitation and ionization of Rydberg atoms,” Research seminar, College of William and Mary, March (1998).

Michael W. Noel, “Atomic Electron Wave Packet Interference and Control,” Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper A16 3 (Invited), Washington, D.C., April (1997).

Submitted Presentations

Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel, "Oscillations in dipole-dipole transitions from nearly degenerate Rydberg states," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper Q1.00186, Atlanta, Georgia, June (2011).

Thomas Carroll, Jon Ward, Alexander Mellus, and Michael Noel, "The Effect of Energy Level Structure on Many-Body Interactions among Rydberg Atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper Q1.00010, Atlanta, Georgia, June (2011).

Emily E. Altiere, Thomas J. Carroll, and Michael W. Noel, "A spectroscopic study of resonant energy exchange among cold Rydberg atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper M1 149, Houston, Texas, May (2010).

Donald P. Fahey, Bonnie L. Schmittberger, and Michael W. Noel, "Rydberg excitation in Rb atoms using external cavity diode lasers," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper M1 152, Houston, Texas, May (2010).

Laura C. Popa and Michael W. Noel, "Spatially resolved imaging of the dipole-dipole energy exchange among ultracold Rydberg atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper T1 125, Charlottesville, Virginia, May (2009).

Thomas Carroll, Christopher Daniel, and Michael Noel, "Computational Studies of any-Body Interactions in Ultra-cold Rydberg Atoms in a Crossed Beam Geometry," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper Y1 111, Charlottesville, Virginia, May (2009).

Thomas J. Carroll, Michael W. Noel, Christopher Daniel, and Timothy Sidie, "Computational Studies of Many-Body Interactions in Ultra-cold Rydberg Atom Samples of Various Geometries," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper L2 127, State College, Pennsylvania, May (2008).

Peter D. Maenner, Thomas J.H. Carroll, and Michael W. Noel, "Investigation into the Dipole-Dipole Interaction between Two Localized Groups of Rydberg Atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper B6 5, Calgary, Alberta, Canada, June (2007).

Thomas Carroll, Cordelia Ochis, and Michael Noel, "Time Dependence of Many-Body Interactions in Ultracold Rydberg Atom Samples of Different Geometries," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper Z4 1, Knoxville, Tennessee, May (2006).

Thomas J. Carroll, Shubha Sunder, and Michael W. Noel, "Many-Body Interactions in a Restricted Dimensionality Sample of Ultra-cold Rydberg Atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper G4 7, Lincoln, Nebraska, May (2005).

Duncan Tate, Wenhui Li, Michael Noel, Michael Robinson, Paul Tanner, Thomas Gallagher, Daniel Comparat, Bruno Labruthe Tolra, Nicolas Van-Haecke, and Pierre Pillet, "Evolution Dynamics of a Dense, Frozen Rydberg Gas to Plasma," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper H4 3, Tucson, Arizona, May (2004).

Michael J. Lim and Michael W. Noel, "Generation of tunable, high energy, nearly transform-limited optical pulses," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper J1 89, Tucson, Arizona, May (2004).

Thomas Carroll and Michael W. Noel, "Manipulation of the Dipole-Dipole Interaction in a Magneto-Optical Trap," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper P1 92, Tucson, Arizona, May (2004).

Thomas Carroll, M. J. Lim, Anne Goodsell, Katharine Claringbould, and Michael W. Noel, "Angular Dependence of the Dipole-Dipole Interaction in a Magneto-Optical Trap," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper C4 9, Boulder, Colorado, May (2003).

Wenhui Li, Igor Mourachko, Michael W. Noel, and T F. Gallagher, "Microwave Spectroscopy of Ultracold Rydberg Atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper P6 63, Williamsburg, Virginia, May (2002).

Michael W. Noel, Lung Ko, and T. F. Gallagher, "Microwave Ionization of a Rydberg Wave Packet," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper P5 6, Storrs, Connecticut, June (2000).

Michael W. Noel, Lung Ko, and T. F. Gallagher, "Phase and frequency dependence of Rydberg wave packet ionization with few-cycle pulses," OSA Annual Meeting, paper MP2 (Invited), Santa Clara, California, September (1999).

Michael W. Noel, Lung Ko, and T. F. Gallagher, "Microwave Ionization of a Rydberg Electron Wave Packet," Gordon Research Conference on Atomic Physics, Plymouth State College, Plymouth, New Hampshire, July (1999).

Michael W. Noel, W. M. Griffith, and T. F. Gallagher, "Dynamic Stabilization in Strong Microwave Fields through Excitation to Extremely Highly Excited States," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper JB13 9, Atlanta, Georgia, March (1999).

Michael W. Noel, W. M. Griffith, and T. F. Gallagher, "Microwave Ionization of Lithium Rydberg Atoms Near Classical Resonances," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper J6 3, Santa Fe, New Mexico, May (1998).

W. M. Griffith, Michael W. Noel, and T. F. Gallagher, "Ionization and State Redistribution of Lithium Rydberg Atoms by Short 8 GHz Microwave Pulses," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper J6 8, Santa Fe, New Mexico, May (1998).

Michael W. Noel, W. M. Griffith, and T. F. Gallagher, "Phase Dependence in Strongly Driven Multiphoton Processes," Gordon Research Conference on Multiphoton Processes, Tilton, New Hampshire, June (1998).

Michael W. Noel, W. M. Griffith, and T. F. Gallagher, "Frequency Modulated Excitation of a Two-Level Atom," Gordon Research Conference on Atomic Physics, New England College, Henniker, New Hampshire, July (1997).

Michael W. Noel, "Atomic Electron Wave Packet Interference and Control," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper A16 3 (Invited), Washington, D.C., April (1997).

Michael W. Noel, W. M. Griffith, and T. F. Gallagher, "Square Wave Population Oscillations in a Two-Level Atom," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper E13-1, Washington, D.C., April (1997).

W. M. Griffith, Michael W. Noel, and T. F. Gallagher, "Phase and Rise Time Dependence of RF Pulses in Multiphoton Processes," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper E12-5, Washington, D.C., April (1997).

Michael W. Noel, David L. Aronstein, and C. R. Stroud, Jr., "Phase evolution of an atomic electron wave packet," OSA Annual Meeting, paper WT4, Rochester, New York, October 20 (1996).

C. R. Stroud, Jr. and Michael W. Noel, "Intra-atomic interferometry and control," OSA Annual Meeting, paper WH4 (Invited), Rochester, New York, October 20 (1996).

Michael W. Noel and C. R. Stroud, Jr., "Coherent Control of an Atomic Electron's Wavefunction," Division of Atomic, Molecular, and Optical Physics Annual Meeting, paper FJ3, Ann Arbor, Michigan, May (1996).

Michael W. Noel, Jake Bromage, and C. R. Stroud, Jr., "Digital production of an arbitrary wave packet," OSA Annual Meeting, paper ThHHH6, Portland, Oregon, September 14 (1995).

Michael W. Noel and C. R. Stroud, Jr., "Phase-sensitive detection and control of Rydberg electron wave packets," OSA Annual Meeting, paper WG3, Dallas, Texas, October 5 (1994).

Michael W. Noel, Z. D. Gaeta, and C. R. Stroud, Jr., "Excitation of a 3-D localized atomic electron wave packet," OSA Annual Meeting, paper FV2, Toronto, Canada, October 8 (1993).