June 2021

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

Marion Reilly Professor in Physics, Department of Physics, Bryn Mawr College, Bryn Mawr, PA 19010
May 2017 – present

Professor, Department of Physics, Bryn Mawr College, Bryn Mawr, PA 19010
September 2012 – May 2017

Associate Professor, Department of Physics, Bryn Mawr College, Bryn Mawr, PA 19010
September 2006 – August 2012

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

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

Postdoctoral research, Department of Physics, University of Virginia, Charlottesville, VA 22901
March 1996 – July 2000
Supervisor: Professor Thomas F. Gallagher

Lecturer, Los Alamos National Laboratory
May 26 - June 4, 1998

Visiting Scientist, *Fundamenteel Onderzoek der Materie*, Amsterdam
October 1997

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. 2011610, "Collaborative Research: Quantum Dynamics and Control with Ultracold Rydberg Atoms," 2020-2023, $345,980 for BMC (with Thomas Carroll at Ursinus College #2011583, $194,550).

The National Science Foundation grant No. 1607377, "Collaborative Research: Cold Rydberg Atoms," 2016-2020, $343,507 for BMC (with Thomas Carroll at Ursinus College #1607335, $174,797).

The National Science Foundation grant No. 1205895, "Collaborative Research: Coherent Control of Interactions among Ultracold Rydberg Atoms," 2012-2016, $328,284 for BMC (with Thomas Carroll at Ursinus College #1205897, $148,857).

The National Science Foundation grant No. 1126656, "MRI: Acquisition of a UHV multi-source sputtering system for multidisciplinary material research," 2011-2012, $239,550. I was listed as CO-PI on this grant. Xuemei Cheng is the PI and primary user of this instrument.

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.

Courses Taught:

Physics 101 – Introductory Physics I
Physics 102 – Introductory Physics II
Physics 104 – Foundations of Physics II
Physics 131 – 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 305 – Advanced Electronics Lab
Physics 309 – Advanced Electromagnetic Theory
Physics 324 – Optics
Physics 331 – Advanced Modern Physics Laboratory
Physics 398 – Senior Seminar
Physics 403 – Supervised Research
Physics 503 – Electromagnetic Theory I
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:

Queenie Jiang, summer 2021
Project: *Stark state interactions*
Catherine Opsahl, summer 2021
Project: *Stark state interactions*
Lila Hernandez, fall 2019
Project: *Laser cooling and trapping*
Charlotte Park, 2019-2020
Project: *Laser cooling and trapping*
Nina Inman, spring 2019
Senior Thesis: *Resonant Few-Body Dipole-Dipole Interactions in an Ultracold Rydberg Gas*
Miao Wang, summer 2018
Project: *Using directed field ionization to observe the np+np->ns+(n+1)s interaction*
Maia Rabinowitz, summer 2018

Project: *Using directed field ionization to observe the np+np->ns+(n+1)s interaction*

Merrilyn Fiagbenu, summer 2018
Project: *Development of a peak-lock circuit for diode laser stabilization*

Shira Steinberg, 2017-2018
Project: *Development of a peak-lock circuit for diode laser stabilization*

Assata Acey, fall 2017
Project: *Construction of an external cavity diode laser*

Ankitha Kannad, 2017-2019
Project: *Optimizing state separation of ultra-cold, highly excited atoms using a genetic algorithm*

Hyunjung Kim, summer and fall 2017
Project: *Quantum beats in the dipole-dipole interaction*

Lamiaa Dakir, summer and fall 2017
Project: *Quantum beats in the dipole-dipole interaction*

Zhimin (Cheryl) Liu, 2016 - 2018
Senior Thesis: *Separating the Unresolvable Signals of Rydberg States through Quantum Control*

Jiayi (Rose) Lin, summer 2016
Project: *Move and reassemble our MOT in the new laboratory space*

Hannah Hastings, summer 2013 - 2016
Senior Thesis: *Interactions of Rydberg Atoms in Electromagnetic Fields: Working Toward Directed Field Ionization*

Georgia Piatt, 2013-2016
Project: *Construction of a high current switch, Characterization of a low finesse Fabry-Perot interferometer*

Rachel Feynman, summer 2013 - 2015
Senior Thesis: *Interference in ionization pathways of atoms excited to coherent superposition states*

Hamna Shahnawz, spring 2015
Project: *Construction of an atom magnetometer*

Ting Xu, summer 2014
Project: *Construction of a laser stabilization circuit*

Rebecca Thayil, 2013
Project: *Characterization of a low finesse Fabry-Perot interferometer*

Noura Jaber, 2013
Project: *Characterization of a low finesse Fabry-Perot interferometer*

Alexandra Friant, summer 2012
Summer Project: *Stark mapping of rubidium atoms*

Xilei Kuang, summer 2012
Summer Project: *Stark mapping of rubidium atoms*

Genevieve Gish Allouche, A.B. May 2012
Senior Thesis: *External cavity diode laser system to examine excited rubidium Rydberg states*

Emily Altiere, 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:

Vincent Gregoric, PhD May 2018,
Thesis: *Rydberg Atoms in the Presence of Electric and Magnetic Fields*
Donald Fahey, PhD May 2014,
Thesis: *Resonant Dipole-Dipole Energy Transfer Dynamics in a Frozen Rydberg Gas*
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:

Alexander Chartrand, August 2017 – February 2018
Thomas Carroll, June 2006 – September 2006
Thomas is currently a Professor at Ursinus College
Michael Lim, September 2002 – July 2003,
Michael is now a Professor at Rowan University

College Service:

Chairman of the Department of Physics, 2021 – 2022
Committee on Undergraduate Admissions, 2019 – 2022
Chairman of the Search Committee for an Assistant Professor of Physics at BMC, 2019 – 2020
Chairman of the Department of Physics, 2018 – 2020
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2017 – 2018
Chair of the Faculty, 2014 – 2016
Advisory Council 2013-2017
Faculty representative to the board of trustees 2013 - 2017
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2015 – 2016
Search Committee for an Assistant Professor of Physics at Bryn Mawr College, 2014 – 2015
Committee on Undergraduate Curriculum, 2012 – 2014
Committee on Laboratories, 2011 – 2012
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 (Chair 2009 – 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:

International Workshop on Ultracold Rydberg Physics, Recife, Brazil, November 2010.
International Workshop on Correlated and Many-Body Phenomena in Dipolar Systems, Dresden, Germany, May 2006.
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.

Honors and Affiliations

Marion Reilly Professor in Physics
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, American Physical Society

Publications

[31] Zhimin Cheryl Liu, Nina P. Inman, Thomas J. Carroll, and Michael W. Noel, "Time Dependence of Few-Body Förster Interactions among Ultracold Rydberg Atoms," Phys. Rev. Lett. **124** 133402 (2020).

[30] Vincent C. Gregoric, Jason J. Bennett, Bianca R. Gualtiere, Hannah P. Hastings, Ankitha Kannad, Zhimin Cheryl Liu, Maia R. Rabinowitz, Zoe A. Rowley, Miao Wang, Lauren Yoast, Thomas J. Carroll, and Michael W. Noel, "Perturbed field ionization for improved state selectivity," J. Phys. B: At. Mol. Opt. Phys. **53** 084003 (2020).

[29] Vincent C. Gregoric, Jason J. Bennett, Bianca R. Gualtiere, Ankitha Kannad, Zhimin Cheryl Liu, Zoe A. Rowley, Thomas J. Carroll, and Michael W. Noel, "Improving the state selectivity of field ionization with quantum control," Phys. Rev. A **98** 063404 (2018).

[28] Vincent C. Gregoric, Xinyue Kang, Zhimin Cheryl Liu, Zoe A. Rowley, Thomas J. Carroll, and Michael W. Noel, "Quantum control via a genetic algorithm of the field ionization pathway of a Rydberg electron," Phys. Rev. A **96** 023403 (2017).

[27] Jacob L Bigelow, Jacob T Paul, Matan Peleg, Veronica L Sanford, Thomas J Carroll and Michael W Noel, "Simulations of the angular dependence of the dipole–dipole interaction among Rydberg atoms," J. Phys. B: At. Mol. Opt. Phys. **49** 164003 (2016).

[26] Rachel Feynman, Jacob Hollingsworth, Michael Vennettilli, Tamas Budner, Ryan Zmiewski, Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel, "Quantum interference in the field ionization of Rydberg atoms," Phys. Rev. A **92**, 043412 (2015).

[25] Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel, "Imaging the dipole-dipole energy exchange between ultracold rubidium Rydberg atoms," Phys. Rev. A **91**, 062702 (2015).

[24] Emily Altiere, Donald P. Fahey, Michael W. Noel, Rachel J. Smith, and Thomas J. Carroll, "Dipole-dipole interactions between rubidium Rydberg atoms," Phys. Rev. A, **84**, 053431 (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

[23] Michael W. Noel, "Resonant energy transfer among ultracold highly-excited atoms," 2018 Annual Meeting of the APS Mid-Atlantic Section, College Park, MD, November (2018).

[22] Michael W. Noel, "Ultracold highly-excited atoms," Marion Reilly Chair Lecture, Bryn Mawr College, November (2017).

[21] Michael W. Noel, "Resonant Energy Exchange Among Cold Rydberg Atoms," International Workshop on Ultracold Rydberg Physics, Recife, Brazil, November (2010).

[20] Michael W. Noel, "Resonant Energy Exchange Among Ultracold Highly-Excited Atoms," Colloquium, University of Connecticut, March (2007).

[19] 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).

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

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

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

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

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

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

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

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

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

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

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

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

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

[5] 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).

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

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

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

[1] 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

[61] Alicia Handian, Nina P. Inman, Thomas J. Carroll, and Michael W. Noel, “Numerical studies of thermalization in few-body Rydberg ineractions," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract F01.00119, Virtual meeting, June (2021).

[60] Nina P. Inman, Briana Strickland, Evan Dryfoos, Thomas J. Carroll, and Michael W. Noel, “Many Body Energy Transfer in an Ultracold Rydberg Gas," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract Q01.00112, Virtual meeting, June (2020).

[59] Zhimin Cheryl Liu, Maia R. Rabinowitz, Miao Wang, Lauren Yoast, Thomas J. Carroll, and Michael W. Noel, "Exploring np+np -> ns+(n+1)s dipole-dipole interactions with genetically optimized field

ionization pulses," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract J05.00005, Milwaukee, Wisconsin, May (2019).

[58] Maia R. Rabinowitz, Miao Wang, Lauren Yoast, Thomas J. Carroll, Michael W. Noel, "Using a Genetic Algorithm to Improve Selective Field Ionization and Study Dipole-Dipole Interactions Among Ultracold Rubidium Rydberg Atoms," Division of Laser Science Annual Meeting, Symposium on Undergraduate Research, Washington DC, September (2018).

[57] Vincent C. Gregoric, Ankitha Kannad, Zhimin Cheryl Liu, Thomas J. Carroll, and Michael W. Noel, " Improving the state selectivity of field ionization with quantum control," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract M01.00107, Ft. Lauderdale, Florida, May (2018).

[56] Jason Bennett, Bianca Gualtieri, Zoe Rowley, Vincent Gregoric, Thomas Carroll, Michael Noel, "Simulations of directed field ionization," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract T01.00108, Ft. Lauderdale, Florida, May (2018).

[55] Jason Bennett, Kevin Choice, Bianca Gualtieri, Ankitha Kannad, Zoe Rowley, Vincent Gregoric, Thomas Carroll, Michael Noel, "Optimizing an electron's path to ionization using a genetic algorithm," Division of Laser Science Annual Meeting, Symposium on Undergraduate Research, Washington DC, September (2017).

[54] Ankitha Kannad, Vincent C. Gregoric, Thomas J. Carroll, Michael W. Noel, "Quantum control of a Rydberg electron's path to ionization using a genetic algorithm," Division of Laser Science Annual Meeting, Symposium on Undergraduate Research, Washington DC, September (2017).

[53] Lamiaa Dakir, Hyunjung Kim, Vincent C. Gregoric, Thomas J. Carroll, Michael W. Noel, "Magnetometry with cold Rydberg atoms," Division of Laser Science Annual Meeting, Symposium on Undergraduate Research, Washington DC, September (2017).

[52] Vincent C. Gregoric, Xinyue Kang, Zhimin Cheryl Liu, Zoe A. Rowley, Thomas J. Carroll, and Michael W. Noel, "Directed Field Ionization," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract U6.10, Sacramento, California, May (2017).

[51] Xinyue Kang, Zoe A. Rowley, Thomas J. Carroll, and Michael W. Noel, "Directed Field Ionization: A Genetic Algorithm for Evolving Electric Field Pulses," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract K1.81, Sacramento, California, May (2017).

[50] Zhimin Cheryl Liu, Vincent C. Gregoric, Thomas J. Carroll, and Michael W. Noel, "Experimental optimization of directed field ionization," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract K1.80, Sacramento, California, May (2017).

[49] Hannah Hastings, Noura B. Jaber, Georgia Piatt, Vincent C. Gregoric, Thomas J. Carroll, and Michael W. Noel, "Diode laser frequency stabilization using a low cost, low finesse Fabry-Perot cavity," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract K1.00160, Providence, Rhode Island, May (2016).

[48] Vincent C. Gregoric, Hannah Hastings, Thomas J. Carroll, and Michael W. Noel, "Quantum beats in the field ionization of Rydberg atoms in the presence of magnetic fields," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract D1.00089, Providence, Rhode Island, May (2016).

[47] Jacob L. Bigelow, Jacob Hollingsworth, Jacob T. Paul, Matan Peleg,Veronica L. Sanford,Thomas J. Carroll, and Michael W. Noel, "Simulations of the angular dependence of the dipole-dipole interaction among Rydberg atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract D1.00120, Providence, Rhode Island, May (2016).

[46] Rachel Feynman, Jacob Hollingsworth, Michael Vennittilli, Tamas Budner, Ryan Zmiewski, Donald P. Fahey, Thomas J. Carroll, and Michael W. Noel, "Quantum Interference in Field Ionization of Rydberg Atoms," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract K1.00092, Columbus, Ohio, May (2015).

[45] Vincent C. Gregoric, Thomas J. Carroll, and Michael W. Noel, "Enhanced Selective Field Ionization with Optical Dumping," Division of Atomic, Molecular, and Optical Physics Annual Meeting, abstract D1.00043, Columbus, Ohio, May (2015).

[44] Jacob Hollingsworth, Tamas Budner, Michael Vennettilli, Ryan Zmiewski, Thomas J. Carroll, Rachel Feynman, and Michael W. Noel, "Quantum Control Using the Landau Zener Effect," Division of Laser Science Annual Meeting, Symposium on Undergraduate Research, Tucson, Arizona, October (2014).

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