

Sarah Ruth Bolton

Curriculum Vitae

President

The College of Wooster

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Education:

Ph.D. in Physics, University of California at Berkeley, December 1995.

Dissertation title: “Dimensionality Dependence of InGaAs Nonlinear Optical Response”,

M.A. in Physics, University of California at Berkeley, May 1991.

B.Sc. in Physics and Biophysics, with Highest University Honors and with Honors in Physics, Brown University, May 1988.

Administrative, faculty and research positions:

President, The College of Wooster 2016-present

Dean of the College, Williams College 2010-2016
Responsible for all aspects of the personal and academic development of students and for creating an inclusive, tightly-woven and equitable community, including Title IX, support for first-generation, low-income and international students, off-campus study, academic advising, fellowships and academic resources.

Chair, Physics Department, Williams College 2007-2010

Professor of Physics, Williams College 2007-2016

Associate Professor of Physics, Williams College 2001-2007

Assistant Professor of Physics, Williams College 1995-2000

Visiting Research Scientist, Lawrence Berkeley National Laboratory (collaborating with research group of Daniel Chemla.) 1998-1999

Board service:

Five Colleges of Ohio (2016-present, chair, 2020-2021)

Great Lakes College Association (2016-present, executive committee 2017-present)

Culture of Respect (2016-present)

Wayne County Economic Development Council (2017-present)

Annapolis Group (2019-present)

Association of Presbyterian Colleges and Universities (2019-present)

North Coast Athletic Conference President’s Council (2016-present)

Grants, Honors and Awards:

Institutional:

Andrew F. Mellon Foundation Grant: *Increasing Diversity and Interdisciplinarity with a Cohort of Scholars* \$1.1 Million 2018-2023

Andrew F. Mellon Foundation new presidents' award: \$100,000 2017-2020

Sherman Fairchild Foundation: "Proposal to Enhance and Expand Support in Quantitative Skills and Reasoning for At-Risk Students in STEM Disciplines at Williams College" \$300,000 2015-2018

Individual:

Williams College Outstanding Mentor Award for Fostering Inclusive Academic Excellence 2009

NSF grant DMR-0203339 "RUI: Dimensionality Dependence of Semiconductor Nonlinear Optical Response." \$150,000 2002-2005

NSF grant ECS-980588 "POWRE: Nonlinear Dynamics in Ultrafast Lasers". \$74,839.00 1998-2001

Research Corporation- Cottrell College Science Award No. CC4695 "Nonlinear Dynamics of Ultrafast Titanium Sapphire Lasers" Research Corp. \$36,530.00 1998-2000

NSF grant PHY-9724246 "Core equipment for a Student/Faculty Research Laser Facility"(co-PI) NSF \$143,912.00, total \$205,589.00 1997-2000

Williams College Class of '41 Fellow: supported sabbatical leave 1998-1999

Physics Teaching Initiative Award, UC Berkeley for work to improve undergraduate physics education and achieve greater diversity in the sciences. 1995

Department of Education Fellowship, to support Ph.D. research at UC Berkeley 1993-1995

Faculty Associate Award, at U.C. Berkeley for excellence in teaching as a graduate student. 1990

Elected to Sigma Xi, Brown University 1988

Senior Physics Prize, Brown University 1988

Senior Biology Prize, Brown University 1988

Publications: Book Chapters

“Higher-order Coulomb Correlation Effects in Semiconductors” by S.R. Bolton. Invited chapter in the book “*Quantum Coherence, Correlation, and Decoherence in Semiconductor Nanostructures*” Edited by T. Takagahara. Published by Elsevier, 2003. pp.166-206

Publications: Refereed Journals

18. “A Quasiperiodic Route to Chaos in the Kerr Lens Modelocked Ti:Sapphire Laser”, S.R. Bolton, Mark R. Acton '00, *Physical Review A*, **62**, 063803, (2000).
17. “Evidence of six-particle Coulomb correlations in six-wave-mixing signals from a semiconductor quantum well” V.M. Axt, S.R. Bolton, U. Neukirch, L.J. Sham, and D.S. Chemla. *Physical Review B*, **63**, 115303, (2001).
16. “Demonstration of sixth-order Coulomb correlations in a semiconductor single quantum well”. S.R. Bolton, U. Neukirch, L.J. Sham, D.S. Chemla and V.M. Axt. *Physical Review Letters*, **85**, 2002, (2000).
15. “Effects of higher-order correlations on the pump-probe response of semiconductors” U. Neukirch, S.R. Bolton, L.J. Sham, and D.S. Chemla. *Physica Status Solidi*, October, (2000).
14. “Polariton-Biexciton transitions in a ZnSe-based microcavity”. U. Neukirch, S.R. Bolton, N.A. Fromer, L.J. Sham, D.S. Chemla, *Journal of Crystal Growth.*, **214**, 1010 (2000).
13. “Nonlinear dynamics in Ultrafast Lasers” S.R. Bolton, R.A. Jenks '98, C.N. Elkinton '98, and G. Sucha. (Invited review paper) *IEEE LEOS newsletter*, **14**, 7, (2000).
12. “Electronic four-particle correlations in semiconductors: Renormalization of pump-probe oscillations”. U. Neukirch, S.R. Bolton, S.R. Bolton, L.J. Sham, and D.S. Chemla. *Physical Review B*, **61**, R7835 (2000).
11. “Polariton-Biexciton Transitions in a Semiconductor Microcavity” U. Neukirch, S.R. Bolton, N.A. Fromer, L.J. Sham, and D.S. Chemla. *Physical Review Letters*, **84**, 2215, (2000).
10. “Pulse resolved measurements of subharmonic oscillations in a Kerr-lens mode-locked Ti:Sapphire laser.” S.R. Bolton, R. A. Jenks '98, C. N. Elkinton'98, and G. Sucha *Journal of the Optical Society of America, B*, **16**, 339, (1999).
9. “Effects of confinement on carrier dynamics in InGaAs heterostructures” Sarah Bolton, Gregg Sucha, and Daniel Chemla, D.L. Sivco, A.Y. Cho, *Physical Review B*, **58**, 16326, (1998).
8. “Effects of cavity topology on the nonlinear dynamics of additive pulse mode locked lasers”. G. Sucha, D.S. Chemla, S.R. Bolton *Journal of the Optical Society of America, B*, **15**, 2847, (1998).
7. "Effects of confinement on energy dependent dephasing in heterostructures" S.R. Bolton, S. Bar-Ad, G. Sucha, D.S. Chemla, D.L. Sivco and A.Y. Cho, *Physical Review B*, **55**, 15768, (1997).

6. "Period-Doubling and quasiperiodicity in additive pulse modelocked lasers" G. Sucha, S.R. Bolton, S. Weiss, and D.S. Chemla, *Optics Letters*, **20**, 1794 (1995).
5. "Period Doubling and Quasiperiodicity in Ultrafast lasers." Gregg Sucha, Sarah R. Bolton, Shimon Weiss and Daniel S. Chemla (invited review paper) *IEEE LEOS Newsletter*, **9**, 8, (1995).
4. "Carrier Relaxation in InGaAs Heterostructures" G. Sucha, S.R. Bolton, D.S. Chemla, D.L. Sivco and A.Y. Cho, *Applied Physics Letters*, **65**, 1486, (1994).
3. "Generation of High-Power Femtosecond Pulses near 1.5 μ m Using a Color-Center Laser System" Gregg Sucha, Sarah R. Bolton, and Daniel S. Chemla, *IEEE Journal of Quantum Electronics*, **28**, 2163 (1992).
2. "Application of Kogelnick's two-wave theory to deep, slanted, highly efficient, relief transmission gratings." Hendrik J. Gerritsen, Donald K. Thornton, and Sarah R. Bolton, *Applied Optics*, **30**, 807 (1991).
1. "Ultraviolet Resonance Raman Spectroscopy of Bacteriorhodopsin: Evidence against Tyrosine in the Photocycle" J. Ames, S.R. Bolton, M. Netto, R. Mathies. *Journal of the American Chemical Society*, **112**, 9007 (1990).

Invited Conference Presentations:

- “Nonlinear Dynamics in Modelocked Lasers” S.R. Bolton, Presented at Gordon Research Conference on Classical Mechanics and Nonlinear Dynamics, June 13-18, 2004, Mt. Holyoke College, South Hadley, MA.
- “Sixth-order Coulomb Correlations identified in a semiconductor single quantum well.” S.R. Bolton, Quantum Electronics and Laser Science Conference, QThG1, Baltimore, Maryland, May 2001.
- “High order correlations in semiconductor nonlinear optical response” S.R. Bolton, Meeting of the Materials Research Society, Boston MA, November 2000.
- “Polariton-biexciton transitions in a semiconductor microcavity” U. Neukirch, S.R. Bolton, N. A. Fromer, Quantum Electronics and Laser Science Conference, QTuI1, San Francisco, CA, May 2000.
- “High Order Correlations in Semiconductor Nonlinear Optical Response” S. R. Bolton, March Meeting of the American Physical Society, G2004, Minneapolis, MN, March 2000.
- "Carrier Dynamics in InGaAs heterostructures". S.R. Bolton, Conference on High Speed Optoelectronic Devices for Communications and Interconnects. San Louis Obispo, CA, August, 1994.

"Carrier Dynamics in InGaAs: quantum wells vs. bulk." S.R. Bolton, G.D. Sucha, D.S. Chemla, D. L. Sivco, and A.Y. Cho. Conference on Lasers and Electrooptics, CTuS5, Anaheim, CA, May 1994

"Recruitment and Retention of Women in Physics-A Graduate Student's Perspective", S. R. Bolton, Annual Joint Meeting of the American Association of Physics Teachers and the American Physical Society. Vancouver, BC, June, 1991.

"Recruitment and Retention of Women in Graduate School". S.R. Bolton, Conference on the recruitment and retention on women in physics. Baltimore, MD, November, 1990.

Conference Presentations-contributed:

"Influence of Quantum Confinement on Exciton-Exciton Coulomb Interactions in InGaAs Heterostructures" S.R. Bolton, S.R. Nichols '03, J.W. Dill '04, J. Simmons '05 and Z. Edwards' 05. International Quantum Electronics Conference, San Francisco, CA. May, 2004.

"Ultrafast measurements of Interactions in Semiconductors", S.R. Bolton, Sarah Nichols '03. Poster presentation, Spring 2003 Meeting of the New England Section of the American Physical Society. Williams College, Massachusetts, April 11, 2003.

"Low Dimensional Chaos in a femtosecond Ti:Sapphire Laser" S.R. Bolton, M.R. Acton '00, Gordon Conference on Nonlinear Optics, Colby Sawyer College, New Hampshire, August 2001.

"High order exciton correlations from six-wave mixing". S. R. Bolton, U. Neukirch, D.S. Chemla, V. M. Axt, L.J. Sham. Quantum Electronics and Laser Science Conference, QThD5, San Francisco, CA, May 2000.

"Effects of higher-order correlations on the pump-probe response of semiconductors" U. Neukirch, S.R. Bolton, L.J. Sham, D.S. Chemla, Nonlinear Optics and Excitation Kinetics in Semiconductors conference, Marburg, Germany, April 2000.

"Polariton-biexciton transitions in a ZnSe-based microcavity" U. Neukirch, S.R. Bolton, N.A. Fromer, L.J. Sham, D.S. Chemla. International Conference on II-VI Materials, Kyoto, Japan, October 1999.

"Spatio-temporal nonlinear Dynamics in a Modelocked Ti:Sapphire Laser" S. Bolton, C. Elkinton, R. Jenks, G. Sucha, CWI40, Conference on Lasers and Electrooptics, San Francisco, CA, May 1998.

"Spatio-temporal Nonlinear Dynamics in a Modelocked Ti:Sapphire Laser" S. Bolton, C. Elkinton, R. Jenks, G. Sucha. Gordon Conference on Nonlinear Optics and Lasers, New Hampshire, August 1997.

“Midgap two-photon four-wave mixing in II-IV semiconductors” S. Bar-Ad, S.R. Bolton, D.S. Chemla, CFB7, Conference on Lasers and Electrooptics, Baltimore, MD, May 1995.

"Effects of Cavity Topology on instabilities of additive-pulse mode-locked lasers" G.Sucha, S.R. Bolton, D.S. Chemla, CThI16, Conference on Lasers and Electrooptics, Anaheim, CA, May 1994.

"Nonlinear Dynamics of additive pulse mode-locked lasers: period-doubling and chaos." G. Sucha, S.R. Bolton, S. Weiss, D.S. Chemla. Conference on Lasers and Electrooptics, JTUC6, Baltimore, MD May 1993.

"Dimensionality Dependence of Semiconductor Nonlinear Optical Response" S.R. Bolton, G. Sucha, D. Botkin, D.S. Chemla, QTuB3. Quantum Electronics and Laser Science Conference. Baltimore, MD May 1993.

"Carrier Dynamics in InGaAs quantum wells: dependence on dimensionality." G.Sucha, S.R. Bolton, D. Botkin, D.S. Chemla, D.L. Sivco, A.Y. Cho. Q28-13, APS March Meeting, Seattle, WA, March, 1993.

"Dimensionality Dependence of Semiconductor Nonlinear Optical Response" S.R. Bolton, G. Sucha, D. Botkin, D.S. Chemla, D.L. Sivco, and A.Y. Cho. I27-1, APS March Meeting, Seattle, WA, March, 1993.

"Femtosecond Pulse Amplification up to 25 μ J at 1.55 microns" G. Sucha, S.R. Bolton, and D.S. Chemla. CLEO. CWD-7, Anaheim, CA May, 1992.

"Differences between the ultrafast TE and TM gain recovery dynamics in quantum well optical amplifiers." S. Weiss, D. Botkin, D.S. Chemla, G. Sucha, S. Bolton. CWK-3, CLEO, Anaheim, CA, May, 1992.

Student thesis and research project supervision:

Senior Theses supervised:

Sarah Whiting Dugan, '97, "**Non-linear Dynamics in a Ti:Sapphire Laser**"

Robert Anand Jenks, '98, "**Spatial and Temporal Nonlinear Dynamics in Kerr-lens Modelocked Ti:Sapphire Laser**"

Christopher Neal Elkinton, '98, "**Period-1 to Period-3 Transition Through Chaos in a Mode-Locked Ti:Sapphire Laser**"

Mark Robert Acton, '00, "**An Investigation of Non-linear Dynamics in a Modelocked Ti:Sapphire Laser**"

Alexander Glenday, '02.

Sarah Roxanna Nichols, '03 –"**Ultrafast Exciton Dynamics in Quantum-Confined Structures**"

Jesse Dill, '04, “**Four-Wave mixing and other observations of Quantum Confined Excitons**”

Samuel Arons, '04, “**Energy Yield and Visual Impact Studies of the Berlin Wind Project**”

Jennifer Simmons, '05 “**Effects of Excitation Bandwidth on Quantum-Confined Excitons**”

Tom Derbish, '08 - “**Towards a system for THz spectroscopy in Semiconductors**”

Stefan Elrington, '09 - “**Terahertz Spectroscopy of Excitons**”

Shirish Poudyal '10 – “**Terahertz Spectroscopy of Quantum Confined Excitons**”

College-wide service at Williams:

Committee Service (* designates a position chosen by all-faculty election).

Diversity Action Research Team	2010-2016
Committee on Academic Standing	2010- 2016
Bias Incident Response Task Force	2011- 2013
Sexual Assault Prevention and Awareness Group	2012-2016
Committee on Admissions and Financial Aid	2010-2016
Faculty interview panel	2006 – 2009
Council of Williams College Women	2000-2002
*Faculty review panel	2000-2002, 2004- 2006, 2008- 2009.
*Committee on Educational Policy	1999-2001, 2010- 2016
Ad Hoc Committee on Grade Inflation	1999
Advisory Committee on Women’s and Gender Studies	1999-2002, 2003- 2006
Olmstead Committee	1999-2000, 2005- 2006
*Faculty Steering Committee	1997-1998, 2003- 2005, 2008-2010
Division III research funding committee	1997-1998
Science Executive Committee	2007-2010
Lecture Committee	1996-1997
Oxford Selection Committee	2002, 2006

Other college service

First year advisor	1996-2016
Initiated interdepartmental cluster in materials science	1998

Departmental Service:

Chair
Pre-engineering advisor

2007-2010
2000-2003

Professional Activities/Service:

External reviewer for Physics departments: Harvey Mudd College, Hamilton College, Swarthmore College, Lewis and Clark College, Amherst College

Reviewer for Journals : Physical Review Letters, Physical Review E, Physical Review B, Applied Physics Letters, Applied Optics, Optics Communications, Optics Express, Journal of the Optical Society of America.

Reviewer for Grants: National Science Foundation (DMR and ECS), Cottrell College Science Award (Research Corporation), Petroleum Research Fund.

Conference Program Committee: IQEC 2004, 2005, 2006.
Ultrafast program committee chair, 2006-2007

Advisor/mentor for the Physics group of the Women in Science and Engineering Program at Brown University. (1997-2005).