Anne C. (Schaefer) Reilly
Curriculum Vitae

Assistant Professor of Physics
College of William and Mary
Williamsburg, VA 23187-8795
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ACADEMIC POSITIONS:

- Assistant Professor (1998-present), Physics Department, College of William and Mary, Williamsburg, VA.
- Research Associate (1996-1998), Department of Physics and Astronomy, Center for Fundamental Materials Research and Center for Sensors Materials, Michigan State University, East Lansing, MI.

EDUCATION:

- Ph.D. in Physics (1996), The University of Michigan.
  Dissertation Title: "Mechanisms of the Low Density Nonlinear Optical Response of Excitons in Gallium Arsenide and the Study of Exciton Transport"
  Advisor: Professor Duncan Steel
- M.S. in Physics (1992), The University of Michigan.
- B.S. in Physics and Mathematics (1988), Magna Cum Laude, Marquette University.

HONORS, PRIZES AND AWARDS:

- National Science Foundation CAREER Award, 2001
- Department of Education Research Fellowship, 1991
- University Fellowship, University of Michigan, 1990
- Outstanding Physics Graduate at Marquette University, 1988
- Dean's List, College of Arts & Sciences, Marquette University, 1985-1988
- Member, Phi Beta Kappa
- Member, Sigma Pi Sigma (Physics), Pi Mu Epsilon (Mathematics) and Alpha Sigma Nu (National Jesuit) Honor Societies

TEACHING:

PHYS 352, *Experimental Modern Physics*, Spring 2004 (co-taught with William Kossler)
PHYS 201, *Modern Physics*, Fall 2003
Summer Seminar, *Femtosecond Laser Science*, Summer 2003
PHYS 102, *General Physics (Lecture)*, Spring 2003
PHYS 201, *Modern Physics*, Fall 2002
PHYS 309, *Undergraduate Seminar*, Spring 2002
Graduate Seminar, *Physics of Ferromagnetism*, Spring 2002
PHYS 309, *Undergraduate Seminar*, Spring 2001
PHYS 102, *General Physics (Problem Sessions)*, Spring 2000
PHYS 251, *Experimental Atomic Physics*, Fall 1999

PHYS 102, *General Physics (Problem Sessions)*, Spring 1999
PHYS 251, *Experimental Atomic Physics*, Fall 1998 (co-taught with John Kane)

STUDENTS SUPERVISED:

GRADUATE ADVISOR

Christopher Allmond, M.S. 2001
Jason Gammon, Ph.D. 2003
Hailong Huang (Ph.D. candidate in physics)
Keoki Seu (Ph.D. candidate in physics)
Shannon Watson (Ph.D. candidate in physics)

Ph.D. THESIS COMMITEES

Yuhang Ren (Applied Science, 2003)
Wendy Vogan (Physics, 2003)
R.A. (Buzz) Wincheski (Physics, 2000)
Deonna Woolard (Applied Science, 2000)
Jonathan Curley (Physics, 2000)
Michael Watkins (Applied Science, 1999)

UNDERGRADUATE ADVISOR

Dimitar Vlassarev (Honors thesis, 2005)
John Mallory (Senior thesis, 2004)
Matthew Schu (Honors thesis, 2003)
Andrew Busch (Honors thesis, 2003)
John Lesoine (summer REU student, 2003)
James Schafer (Senior thesis, 2002)
Haley Showman (Honors thesis, 2002)
Jonathan Columbia (summer REU student, 2002)
Lauren Chaikin (summer REU student, 2002)
Hugh Carney (Senior thesis, 2001)
Travis Turner (Honors thesis, 2001)
Chad Weiler (summer REU student, 2001)
Adam Cohen (Senior thesis, 2000)
Heather Faltin (Honors thesis, 2000)
Jennifer Wilkes (Honors thesis, 2000)

FELLOWSHIPS AND GRANTS:

- National Science Foundation (pending), "Development of a High-Brightness Tunable Femtosecond X-ray Source", 2004-2005, **$741,000**. (co-PI with Gunter Luepke)
- National Science Foundation, "*CAREER: Nonlinear Optical Studies of Spin and Magnetization Dynamics in Ferromagnetic Multilayers*", 2001-2006, **$450,000**.
- Jeffress Memorial Trust, "Investigation of Pulsed Laser Deposition of Magnetic Multilayer Systems", 2000-2004, **$50,000**.

- Virginia Space Grant Consortium (Graduate Fellowships), Shannon Watson, Keoki Seu and Jason Gammon, **$15,000**.
- National Science Foundation, *"Acquisition of a Superconducting Magnetooptical Cryostat for Research and Student Training in Magnetoelectronic Materials"*, 2001-2002, **$56,210**.
- Air Force Office of Sponsored Research (through UNC-Charlotte) *"High-Density, Three Dimensional Packaging Technology for Giant Magnetoresistive Memory Devices"*, 2001-2003, **$217,939**. (co-PI with Brian Holloway)
- American Chemical Society Petroleum Research Fund, "*Hard Carbon as an Active Layer in Magnetoelectronic Devices"*, 2001-2003, **$25,000**.
- Research Corporation, Research Innovation Award, "Incorporation of Hard Carbon Thin Films with Magnetic and Giant Magnetoresistive Systems", 1999-2001, **$35,000**.
- National Science Foundation, *"POWRE: Investigation of Laser-Target Interactions in Pulsed Laser Deposition Using a Picosecond, Tunable Pulsed Free Electron Laser"* 1999-2001, **$69, 556**.

RESEARCH:

REFEREED PUBLICATIONS:

POST-GRADUATE

"Ultrafast Laser Spectroscopy of the Half-Metal CrO_2", H. Huang, K. Seu, A. Reilly, W. Egelhoff, **in preparation** for *Physical Review B*, 2004.

"Exchange Biasing in FeMn/Co Probed with MOKE and Polarized Neutron Reflectivity", K. Seu, A. Reilly, J. Borchers and K. O'Donovan, **in preparation** for the *Journal of Magnetism and Magnetic Materials*, 2004.

"Ultrafast Magnetization Oscillations in Exchange-Biased IrMn/Co", K. Seu, H. Huang, A. Reilly, W. Egelhoff, L. Gan, **in preparation** for the *Journal of Applied Physics*, 2004.

"Carbon Nitride as a Buffer Layer for Magnetic Thin Films", S. Watson, L. Zeng, J. Musielski, B. Wincheski, A. Wilkerson, E Broitman, A. Reilly, and B. Holloway, **to be published**, *Thin Solid Films*, (2004).

"Bonding in hard and elastic amorphous carbon nitride films investigated using ^{15}N, ^{13}C, and ^{1}H NMR spectroscopy", W.J. Gammon, G.L. Hoatson, B.C. Holloway, R.L. Vold, A.C. Reilly, *Physical Review B*, **68**, 195401-9 (2003).

- Selected for the November 17, 2003 issue of the *Virtual Journal of Nanoscale Science & Technology*.

"Magnetic properties of sputtered soft magnetic Fe-Ni films with a uniaxial anisotropy", Jung Gi Kim, Kyung Huun Han, Seok Ho Song, Anne Reilly, *Thin Solid Films*, **440**, 54-59 (2003).

"Pulsed Laser Deposition with a high average power free electron laser: Benefits of subpicosecond pulses with high repetition rate", Anne Reilly, Chris Allmond, Shannon Watson, Jason Gammon and Jung-Gi Kim, *Journal of Applied Physics*, **93**, 3098-3101 (2003).

- Selected for the March, 2003 issue of the *Virtual Journal of Ultrafast Science*.

"Experimental Comparison of N(1s) and C(1s) XPS Binding Energies of Amorphous Carbon Nitride with Reference Organic Compounds", W. J. Gammon, O. Kraft, A. C. Reilly and B. C. Holloway, *Carbon*, **41**, 1917-1920 (2003).

"Co layer thickness dependence of exchange biasing for IrMn/Co and FeMn/Co", K.A. Seu, H. Huang, J.F. Lesoine, H.D. Showman, W,F, Egelhoff, L. Gan and A.C. Reilly, *Journal of Applied Physics*, **93**, 6611-13 (2003).

"Hard and elastic amorphous carbon nitride thin films studied by ^{13}C nuclear magnetic resonance spectroscopy", W.J. Gammon, D.I. Malyarenko, O. Kraft, G.L. Hoatson, A.C. Reilly and B.C. Holloway, *Phys. Rev. B*, **66**, 153402-153404 (2002).

"Enhancing current-perpendicular magnetoresistance in Permalloy-based exchange-biased spin valves by increasing spin-memory loss", J.Y. Gu, S.D. Steenwyk, A C. Reilly, W. Park, R. Loloee, J. Bass, W.P. Pratt Jr., *Journal of Applied Physics*, **87**, 4831-4833 (2000).

"Microscopic Mechanisms of Giant Magnetoresistance", C. Vouille, A. Barthelemy, F. Elokan Mpondo, A. Fert, P.A. Schroeder, S.Y. Hsu, A. Reilly and R. Loloee, *Physical Review B*, **60**, 6710-6722 (1999).

"Effect of deposition parameters on the CPP-GMR of NiMnSb-based spin-valve structures.", J.A. Caballero, A.C. Reilly, Y. Hao, J. Bass, W.P. Pratt Jr, F. Petroff, J.R. Childress., *Journal of Magnetism & Magnetic Materials*, **198-199**, 55-7 (1999).

"Perpendicular Giant Magnetoresistance of $Co_{91}Fe_9$/Cu Exchange-Biased Spin-Valves: A Further Test of the Unified Picture", A.C. Reilly, W. Park, R. Slater, B. Ouaglal, R. Loloee, W.P. Pratt Jr., J. Bass, *Journal of Magnetism and Magnetic Materials*, **195**, L269-L274 (1999).

"Giant Magnetoresistance of Current-Perpendicular Exchange-Biased Spin Valves of Co/Cu", A.C. Reilly, W. C. Chiang, W. Park, S. Y. Hsu, S. Steenwyk, W. P. Pratt, Jr., J. Bass, *IEEE Transactions on Magnetics*, **34**, 939-942 (1998).

"Magnetoresistance of NiMnSb-based Multilayers and Spin Valves", J. A. Caballero, J. Bass, W. C. Chiang, A. C. Reilly, W. P. Pratt, Jr., F. Petroff, Y. D. Park and J. R. Childress, *Journal of Vacuum Science and Technology A*, **16**, 1801-1805 (1998).

GRADUATE

"Nonlinear Optical Response of the GaAs Exciton-Polariton", Anne C. Schaefer and Duncan G. Steel, *Physical Review Letters*, **79**, 4870-4874 (1997).

"Nondiffusive Excitonic Transport in GaAs and the Effects of Momentum Scattering", A.C. Schaefer, J. Erland and D.G. Steel, *Physical Review B*, **54**, R11046-R11049 (1996).

"Polarization Dependence of the Frequency Domain Four-Wave Mixing Response of Excitons in GaAs", Min Jiang, A.C. Schaefer, D.G. Steel, *Physical Review B*, **51**, 16714-16719 (1995).

"Coherent Nonlinear Optical Spectroscopy Using Photon-Number Squeezed Light" D. C. Kilper, A. C. Schaefer, J. Erland and D. G. Steel, *Physical Review A*, **54**, R1785-R1788 (1996).

"Resonant nonlinear optical behavior in semiconductor heterostructures", A.C. Schaefer and D.G. Steel, in *Properties of III-V Quantum Wells and Superlattices,* P.K. Bhattacharya, ed. (INSPEC, London, 1996).

"Magnetic-Field-Induced Resonance in Four-Wave-Mixing in GaAs", Min Jiang, A.C. Schaefer, P.R. Berman, D.G. Steel, *Physical Review B*, **50**, 5799-5782 (1994).

UNDEGRADUATE

J. M. Grebowsky and A. Schaefer, "Ion Mass Spectrometer Measurements from the Space Shuttle", *Indian Journal of Radio and Space Physics*, **19**, 49-61 (1990).

CONFERENCE PRESENTATIONS, LECTURES, AND UNREFEERED PUBLICATIONS:

POST-GRADUATE

"Impact of Large Scale Substrate Roughness on Giant Magnetoresistance Multilayers", S. Watson, D. Vlassarev; A. Reilly, B. Holloway, presented at the 9th Joint MMM-Intermag Conference (Conference on Magnetism and Magnetic Materials), Anaheim, CA January 5-9, 2004.

"Ultrafast MOKE Study of Magnetization Dynamics in Exchange-Biased FeMn/Co and IrMn/Co Thin Films", K. Seu, H. Huang, A.C. Reilly, W.F. Egelhoff, L Gan, presented at the American Vacuum Society (AVS) 50th International Symposium, Baltimore, MD, November 2-7, 2003.

"Ultrafast Laser Measurements of Electron and Spin Dynamics in Half-metallic CrO_2 Thin Films", H. Huang, K. Seu,, A.C. Reilly, W.F. Egelhoff, Y. Kadmon, presented at the American Vacuum Society (AVS) 50th International Symposium, Baltimore, MD, November 2-7, 2003.

"Using NMR to Probe the Bonding in Amorphous Carbon Nitride Thin Films", W.J. Gammon, O. Kraft, G. L. Hoatson, A.C. Reilly, B.C. Holloway, presented at the American Vacuum Society (AVS) 50th International Symposium, Baltimore, MD, November 2-7, 2003.

"Pulsed laser deposition with the Thomas Jefferson National Accelerator Facility free electron laser: benefits of sub-picosecond pulses with high repetition rate", Anne Reilly, Chris Allmond, Jason Gammon, Jung Kim, Michelle Shinn, Shannon Watson, presented at CLEO/QELS, Conference on Lasers on Electro-optics, Baltimore, MD, June 1-6, 2003.

"Pulsed Laser Ablation and Deposition with the Thomas Jefferson National Accelerator Facility Free Electron Laser", Anne Reilly, Chris Allmond and Michelle Shinn, presented at the American Physical Society DAMOP meeting, Williamsburg, VA, 2002.

"Ultrafast Pump-Probe Laser Spectroscopy of the Half-Metal CrO_2", A.C. Reilly, H. Huang, K. Seu, Y. Kadmon and W. Egelhoff, Jr., presented at the 47th Conference on Magnetism and Magnetic Materials, Tampa, FL, 2002.

"Carbon Nitride as a Buffer Layer for Magnetic Thin Films", S. Watson, L. Zeng, J. Musielski, B. Wincheski, A. Wilkerson, E. Broitman, A. Reilly and B. Holloway, presented at the 47th Conference on Magnetism and Magnetic Materials, Tampa, FL, 2002.

"Co Layer Thickness Dependence of Exchange Biasing of IrMn/Co and FeMn/Co", K.A. Seu, H. Huang, J.F. Lesoine, H.D. Showman, W,F, Egelhoff, L. Gan and A.C. Reilly, presented at the 47th Conference on Magnetism and Magnetic Materials, Tampa, FL, 2002.

"Spin and magnetization-dependent dynamics, transitions and transport at interfaces in ferromagnetic/semiconducting and ferromagnetic/metallic heterostructures", Gunter Lüpke and Anne Reilly, presented at the 2000 Spins in Semiconductors Workshop, sponsored by DARPA (Santa Barbara, CA).

"Perpendicular-Current Spin Valve Structures with Micron-size Nb Top Contacts" R.D. Slater, J.A. Caballero, W.P. Pratt, Jr. and A.C. Reilly, presented at the American Physical Society 2000 March Meeting (Minneapolis, MN).

"Apparent Spin Memory Loss at Co/Nb Interfaces in Current-Perpendicular Exchange-Biased Spin Valves", J.A. Caballero, A.C. Reilly, R. Loloee, J. Bass and W. P. Pratt Jr., presented at the American Physical Society 2000 March Meeting, (Minneapolis, MN).

"Pulsed Laser Deposition with the Jefferson Laboratory Free Electron Laser", A. Reilly, presented at the January, 2000 Laser Processing Consortium (LPC) Workshop (Newport News, VA).

"Pulsed Laser Deposition with the Jefferson Laboratory Free Electron Laser", A. Reilly, presented at the June, 2000 Laser Processing Consortium (LPC) Workshop (Newport News, VA).

"Pulsed Laser Deposition with a High Average Power Free Electron Laser", Anne Reilly, Jason Gammon, Chris Allmond, Michael Kelley, Michelle Shinn and Larry Phillips, presented at the 22nd International Free Electron Laser Conference and 7th FEL Users Workshop (Duke University, Durham, NC).

"Pulsed Laser Deposition with a High Average Power Free Electron Laser", Anne Reilly, Jason Gammon, Chris Allmond, Adam Cohen, Michelle Shinn and Larry Phillips, presented at the Gordon Conference on Laser Interactions with Materials, Proctor Academy in Andover, NH, June, 2000.

"Microscopic Mechanisms of Giant Magnetoresistance", Anne Reilly, Workshop on Thin Films, Surfaces and Materials Processing, Applied Research Center, Newport News, VA, May 2000.

"Enhancing Magnetoresistance by Increasing Spin-Memory Loss", J. Gu, W. Park, R. Loloee, J. Bass, W. P. Pratt, Jr., S. D. Steenwyk and A.C. Reilly, presented at the 1999 Conference on Magnetism and Magnetic Materials (San Jose, CA).

"Pulsed Laser Deposition with the Jefferson Laboratory Free Electron Laser", A. Reilly, at the June, 1999 Laser Processing Consortium (LPC) Workshop (Newport News, VA).

"Spin Diffusion Lengths in metals and Semiconductors", invited lecture, National Institute of Science and Technology, Gaithersburg, MD., Nov. 8, 1999.

GRADUATE

J. C. Kim, G. Chen, A. C. Schaefer, "Strongly Localized Excitons in a Narrow Single Quantum Well: Ensemble Dynamics of Single-Quantum-Dot Excitons", QELS '97 (Quantum Electronics and Laser Science Conference), *OSA Technical Digest* **12**, p. 63-64 (1997).

A. C. Schaefer, N. H. Bonadeo, D. G. Steel, "The Coherent Nonlinear Optical Response of the Exciton-Polariton", QELS '97, *OSA Technical Digest* **12**, p. 148-149 (1997).

A. C. Schaefer and D. G. Steel, "The Effects of Momentum Scattering on Exciton Motion: Observation of Non-Diffusive Transport", IQEC '96, (International Quantum Electronics Conference) (1996).

A. C. Schaefer, N. H. Bonadeo, D. G. Steel, "The Nonlinear Optical Response of the Exciton-Poalriton", presented at the American Physical Society March Meeting, 1997.

A. C. Schaefer, D. G. Steel, "Non-Diffusive Transport of Excitons in GaAs and the Effects of Momentum Scattering" presented at the American Physical Society March Meeting, 1996.

A. C. Schaefer, J. Erland, D.G. Steel, "Non-Diffusive Excitonic Transport in GaAs: Evidence for Polariton Propagation", QELS '95, *OSA Technical Digest* **16**, p. 114-115 (1995).

A. C. Schaefer, N. H. Bonadeo and D. G. Steel, "Transition to a Multiphoton Excitonic Response in GaAs", QELS '95, *OSA Technical Digest* **16**, p. 256 (1995).

Duncan G. Steel, Hailin Wang, Steve Cundiff, Min Jiang, Kyle Ferrio, Anne Schaefer, "Coherences and Dynamics of Resonances in Semiconductor Heterostructures," presented at the Workshop on Optical Properties of Mesoscopic Semiconductor Structures, Snowbird, CO, 1993.

D.G. Steel, Kyle Ferrio, H. Wang, Min Jiang, Anne Schaefer, "The role of exciton interactions in the GaAs nonlinear optical response", presented at the International Workshop on Lasers, 1994

Duncan G. Steel, Min Jiang, Anne Schaefer, Nicholas Bonadeo, Kyle Ferrio, "Four-wave mixing experiments on semiconductors", presented at the Radiative Processes and Dephasing in Semiconductors, 1994.

Min Jiang, A. C. Schaefer, D.G. Steel "Measurement of the Red Shift due to Spin-Dependent Nonlinear Interactions in GaAs", IQEC '94, *OSA Technical Digest* **9**, p. 120-121 (1994).

UNDERGRADUATE

M. Mante, V. Dhuru, W. Deshotels, A. Schaefer and W. Brantley, "Transmission of Light Through Composite Restorative: Relationship with Thickness and Shade", *Journal of Dental Research*, **65** (1986).

PROFESSIONAL SERVICE

- 2000-present, Physics Department Graduate Admissions Committee.
- 2003-present, Physics Department Building Committee.
- 2000-2001, 2003-2004, Physics Department Faculty Search Committee.
- 1999-present, Liaison for pulsed laser deposition at the Thomas Jefferson National Accelerator Facility Free Electron Laser facility.
- 2003, Mentor for the College of William and Mary Chancellor Academy (research experience for high school juniors).
- 1998-present, member of American Physical Society.
- 2004-present, member of American Vacuum Society.
- 2001-present, Coordinated educational outreach to local middle schools
- 2001, College of William and Mary Career Services, academic panelist.
- 2000-present, College of William and Mary Phi Beta Kappa election committee.
- 2001, Thomas Jefferson Prize for Natural Science election committee.
- 2000, Member of Program Committee for Workshop on Thin Films, Surfaces and Materials Processing (May 18-21, 2000, Applied Research Center Newport News, Virginia).
- 2000, Talk at Jefferson Lab Graduate Lunch series: “Physics Careers in Academia”.
- 2000, Organizing Committee for site visit of the NSF Committee on the Status of Women in Physics.
- 2000-present, Reviewer for National Science Foundation.
- 2000-present, Reviewer for *Journal of Applied Physics.*
- 2001-present, Reviewer for *Journal of Magnetism and Magnetic Materials.*
- 2001-present, Reviewer for *Journal of Vacuum Science and Technology.*
- 2004-present, Reviewer for *Material Science and Engineering.*
- 2000, Session Chair for the American Physical Society DAMOP meeting.
- 1999, New Faculty Workshop participant, funded/hosted by NSF.
- 1999-present, Supplied and graded problems for physics graduate qualifying exams.