

Dr. Mark E. Siemens
Assistant Professor of Physics and Astronomy, University of Denver
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Education

Ph.D. in Physics, University of Colorado (2009)
Thesis: “Nanoscale thermal, acoustic, and magnetic dynamics probed with soft x-ray light”
Thesis advisors: Margaret Murnane and Henry Kapteyn
B.S. in Engineering Physics, Colorado School of Mines (2003)

Professional Experience

Associate Professor of Physics and Astronomy, University of Denver, 2016-present
Assistant Professor of Physics and Astronomy, University of Denver, 2010-2016
Postdoctoral research associate at NIST/JILA (Advisor: Steven Cundiff), 2009-2010
Ph.D Research Assistant, JILA/Physics, University of Colorado, 2003-2009
Undergraduate Research Assistant, Colorado School of Mines (CSM), 2002

Awards

2016 NSF CAREER award
2016 Fulbright Fellowship to Argentina
2016 Franklin Research Grant from the American Philosophical Society
DU Natural Science and Mathematics “Outstanding Junior Faculty” award, 2015
National SPS outreach Blake Lilly Award, 2015 (Faculty mentor)
DU Natural Science and Mathematics “Outstanding Faculty Service” award, 2014
American Chemical Society, Petroleum Research Fund, “Doctoral New Investigator” Sept. 2012
University of Denver collaborative equipment grant, Dec. 2010, 2012
National Research Council Postdoctoral Research Associate (Jan. 2010-Aug. 2010)
Distinguished Physics Graduate, Colorado School of Mines (2003)
Eugene McMahan and President’s Academic Scholarship, and Honor Roll CSM (1999-2003)

Teaching and Outreach Experience at DU

Coordinated Society of Physics Students outreach, hands-on small-group demos, 2011-present
On-campus outreach: interacted with > 1,200 students from K-12 Denver schools
Off-campus outreach at Elitch Gardens, pro hockey games, and more for > 2,500 people
Hosted high school intern through Denver’s JumpStart program, summer 2013, 2014
Diverse teaching experience at DU, 2010-present
1st year courses: FSEM (F10, 11, 12, 14, 15), UPhys 2 (S12, 14)
Upper-division physics courses: Analytical Mech (W11, 13, 15), Thermal Phys (W12, 14, 16)
Graduate courses: Grad Dynamics (F13)

Service to DU Department of Physics and Astronomy

Society of Physics Students faculty advisor, Fall 2011-2016
Served on two faculty search committees and mentored young teaching faculty
Undergraduate committee member, Fall 2010-2016
Chair, undergraduate committee, Fall 2011
Coordinated undergraduate assessment, Fall 2011-2016
Colloquium organizer, Fall 2011-2016
Academic advisor for 19 physics majors
Supervised undergraduate research for 19 students, including 14 DU-funded student proposals
Served on 21 graduate student committees: comprehensive exam, thesis proposal, MS/PhD thesis

Sample Professional Activity

Co-chair, Colorado Ultrafast Photonics Initiative (CUPhI) spring workshop, April 2015
Founding member of the Colorado Ultrafast Photonics Initiative, December 2014 – present
Member, Molecular and Cellular Biophysics program at DU, 2013 – present
Session chair at American Physical Society 4 Corners Fall Meeting, Oct. 2009, 2012, 2013, 2015
Referee for publications in Nature Nanotechnology, Physical Review Letters, Nano Letters, Optics Letters, Physical Review B, Langmuir, Optical Materials Express, Applied Physics Letters, Journal of Applied Physics, Applied Surface Science, MMM (Magnetism and Magnetic Materials) Conference Proceedings, and Photonics Journal
Internal referee of pre-submission articles for NIST, 2009 – 2010
Member of OSA, APS, AAPT, and IEEE

Newsbriefs and general interest pieces highlighting work

“Determining the System Hamiltonian with Optical 3-D Spectroscopy”, Optics and Photonics News 24, 50 (2014)
“JILA MONSTR and the Chamber of Secrets”, JILA: Light and Matter, Summer 2011
“The Magnetic Heart of the Matter”, JILA: Light and Matter, Spring 2010
“Ballistic Evidence”, JILA: Light and Matter, Winter 2009
“Heat Goes Ballistic”, Physics Update, Physics Today, July 2008

Publications

24. R. D. Niederriter, M. E. Siemens, and J. T. Gopinath, “Simultaneous control of orbital angular momentum and beam profile in two-mode polarization-maintaining fiber,” *accepted for publication in Optics Letters*.
23. S. N. Alperin, R. D. Niederriter, J. T. Gopinath, and M. E. Siemens, “Quantitative measurement of the orbital angular momentum of light with a single, stationary lens,” *Optics Letters* **41**, 5109-5022 (2016). *This paper was selected as the “Editor’s Pick” for the Nov. 1 edition of Optics Letters.*
22. R. Singh, T. Suzuki, T. M. Autry, G. Moody, M. E. Siemens, and S. T. Cundiff, “Polarization Dependent Exciton Linewidth in Semiconductor Quantum Wells – a Consequence of Bosonic Nature of Excitons”, *Physical Review B, Rapid Communications* **94**, 081304 (2016).
21. R. D. Niederriter, M. E. Siemens, and J. T. Gopinath, “Continuously tunable orbital angular momentum generation using a polarization-maintaining fiber,” *Optics Letters* **41**, 3213-3216 (2016). *This was the 2nd-most downloaded paper in Optics Letters for July 2016.*
20. R. Singh, G. Moody, M. E. Siemens, H. Li, and S. T. Cundiff, “Quantifying Spectral Diffusion by Direct Measurement of the Correlation Function for Excitons in Semiconductor Quantum Wells,” *Journal of the Optical Society of America B*, **33**, C137-C143 (2016).
19. Q. Chen, C. Zhang, M. Zhu, S. Liu, M. Siemens, S. Gu, J. Zhu, J. Shen, X. Wu, C. Liao, J. Zhang, X. Wang, and M. Xiao, “Efficient Thermal Conductance in Organometallic Perovskite CH₃NH₃PbI₃ Films,” *Applied Physics Letters* **108**, 081902 (2016).
18. J. D. Bell, R. Conrad, and M. E. Siemens, “Analytical calculation of two-dimensional spectra,” *Optics Letters* **40**, 1157 (2015).
17. R. D. Niederitter, J. T. Gopinath, and M. E. Siemens, “Measurement of the M² beam propagation factor using a focus-tunable liquid lens,” *Applied Optics* **52**, 1591 (2013).
16. H. Li, A. D. Bristow, M. E. Siemens, G. Moody, and S. T. Cundiff, “Unraveling quantum pathways using optical 3D Fourier-transform spectroscopy,” *Nature Communications* **4**, 1390

- (2013). *This paper was selected as an "Editors Choice" in the March 22, 2013 issue of Science and was highlighted in the "Optics in 2013" issue of Optics and Photonics News.*
15. S. Mathias, C. La-O-Vorakiat, P. Grychtol, J. M. Shaw, R. Adam, H. T. Nembach, M. E. Siemens, S. Eich, C. M. Schneider, T. J. Silva, M. Aeschlimann, H. C. Kapteyn, and M. M. Murnane, "Probing the timescale of the exchange interaction in a ferromagnetic alloy," *Proceedings of the National Academy of Sciences* **109**, 4792 (2012).
 14. D. B. Turner, P. Wen, D. H. Arias, K. A. Nelson, H. Li, G. Moody, M. E. Siemens, and S. T. Cundiff, "Persistent exciton-type many-body interactions in GaAs quantum wells measured using two-dimensional optical spectroscopy," *Physical Review B* **85**, 201303(R) (2012).
 13. Q. Li, K. Hooqboom-Pot, D. Nardi, M. E. Siemens, O. Hellwig, E. Dobisz, B. Gurney, M. M. Murnane, H. C. Kapteyn, R.G. Yang, and K. A. Nelson, "Generation and control of ultrashort-wavelength two-dimensional surface acoustic waves at nanoscale interfaces," *Physical Review B* **85**, 195431 (2012).
 12. D. Nardi, M. Travagliati, M. E. Siemens, Q. Li, M. M. Murnane, H. C. Kapteyn, G. Ferrini, F. Parmigiani, F. Banfi, "Probing Thermomechanics at the Nanoscale: Impulsively Excited Pseudosurface Acoustic Waves in Hypersonic Phononic Crystals", *Nano Letters* **11**, 4126 (2011).
 11. G. Moody, M. E. Siemens, A. D. Bristow, X. Dai, A. S. Bracker, D. Gammon, and S. T. Cundiff, "Exciton relaxation and coupling dynamics in a GaAs/AlxGa1-xAs quantum well and quantum dot ensemble", *Physical Review B* **83**, 245316 (2011).
 10. A. D. Bristow, T. Zhang, M. E. Siemens, S. T. Cundiff, and R. P. Mirin, "Separating Homogeneous and Inhomogeneous Line Widths of Heavy- and Light-Hole Excitons in Weakly Disordered Semiconductor Quantum Wells," *Journal of Physical Chemistry B* **115**, 5365 (2011).
 9. G. Moody, M. E. Siemens, A. D. Bristow, X. Dai, D. Karaiskaj, A. S. Bracker, D. Gammon, and S. T. Cundiff, "Exciton-exciton and exciton-phonon interactions in an interfacial GaAs quantum dot ensemble", *Physical Review B* **83**, 115324 (2011).
 8. G. Moody, M. E. Siemens, A. D. Bristow, X. Dai, D. Karaiskaj, A. S. Bracker, D. Gammon, and S. T. Cundiff, "Spectral broadening and population relaxation in a GaAs interfacial quantum dot ensemble and quantum well nanostructure," *physica status solidi b* **248**, 829 (2011).
 7. M. E. Siemens, G. Moody, H. Li, A. D. Bristow, and S. T. Cundiff, "Resonance lineshapes in two-dimensional Fourier transform spectroscopy," *Optics Express* **18**, 17699 (2010).
 6. M. E. Siemens, Q. Li, M. M. Murnane, H. C. Kapteyn, R.G. Yang, K. A. Nelson, "Quasi-ballistic thermal transport from nanoscale interfaces observed using ultrafast coherent soft X-ray beams", *Nature Materials* **9**, 26 (2010).
 5. C. La-O-Vorakiat, M. Siemens, S. Mathias, M. Aeschlimann, P. Grychtol, R. Adam, C. M. Schneider, J. M. Shaw, H. Nembach, T. J. Silva, M. M. Murnane, and H. C. Kapteyn, "Ultrafast Demagnetization Dynamics at the *M* Edges of Magnetic Elements Observed Using a Tabletop High-Harmonic Soft X-Ray Source," *Physical Review Letters* **103**, 257402 (2009).
 4. M. E. Siemens, Q. Li, M. M. Murnane, H. C. Kapteyn, R.G. Yang, E. H. Anderson, K. A. Nelson, "High-Frequency Surface Acoustic Wave Propagation in Nanostructures Characterized by Coherent Extreme Ultraviolet Beams", *Applied Physics Letters* **94**, 093103 (2009).
 3. R. I. Tobey, M. E. Siemens, O. Cohen, M. M. Murnane, H. C. Kapteyn, and K. A. Nelson, "Ultrafast extreme ultraviolet holography: dynamic monitoring of surface deformation," *Optics Letters* **32**(3), 286 (2007).
 2. R. I. Tobey, M. E. Siemens, M. M. Murnane, H. C. Kapteyn, D. Torchinsky, and K. A. Nelson, "Transient grating measurement of surface acoustic waves in thin metal films with extreme ultraviolet radiation," *Applied Physics Letters* **89**, 091108 (2006).

1. R. I. Tobey, E. Gershgoren, M. E. Siemens, M. M. Murnane, H. C. Kapteyn, T. Feurer, and K. A. Nelson, "Nanoscale photothermal and photoacoustic transients probed with extreme ultraviolet radiation," *Applied Physics Letters* **85**, 564 (2004).

Conference Proceedings published in book form

11. H. Li, A. D. Bristow, M. E. Siemens, G. Moody, S. T. Cundiff, "Optical three-dimensional coherent spectroscopy," *Ultrafast Phenomena and Nanophotonics XVIII (Proceedings of SPIE)*, 2014.
10. "Determination of System Hamiltonian with Multi-dimensional Spectroscopy," *Proceedings of Laser Science, Precision Spectroscopy (LM3H)*, Oct. 2013.
9. G. Moody, M. E. Siemens, A. D. Bristow, X. Dai, D. Karaiskaj, A. S. Bracker, D. Gammon, and S. T. Cundiff, "Revealing exciton dephasing and transport dynamics in semiconductor quantum well – quantum dot systems using optical 2D Fourier transform spectroscopy," (*Proceedings of SPIE*), 2012.
8. S. Mathias, C. La-O-Vorakiat, P. Grychtol, R. Adam, M. E. Siemens, J. M. Shaw, H. Nembach, M. Aeschlimann, C. M. Schneider, T. J. Silva, M. M. Murnane, and H. C. Kapteyn, "Ultrafast, Element-Specific, Demagnetization Dynamics Probed using Coherent High Harmonic Beams," in *Ultrafast Phenomena XVII: Proceedings of the 17th International Conference, Snowmass, Colorado, United States, July 18-23, 2010*, M. Chergui et al, ed. (Oxford University Press, New York, 2011), pp. 149-151.
7. M. E. Siemens, Q. Li, R.G. Yang, and K. A. Nelson, E. H. Anderson, M. M. Murnane, H. C. Kapteyn, "Quasi-ballistic thermal transport from nanoscale interfaces observed using ultrafast coherent soft x-ray beams," *Ultrafast Phenomena in Semiconductor and Nanostructure Materials XV*, 7937-16 (*Proceedings of SPIE*), 2011.
6. M. Siemens, Q. Li, M. Murnane, H. Kapteyn, R.G. Yang, and K. Nelson, "Nanoscale Heat Transport Probed with Ultrafast Soft X-Rays," in *Ultrafast Phenomena XVI (Springer Series in Chemical Physics)*, 2009.
5. M. Siemens, Q. Li, M. Murnane, H. Kapteyn, and R.G. Yang, and K. Nelson, "Measuring nanoscale heat transport with EUV light from HHG", *Sixth Annual Ultrashort Pulse Laser Materials Interaction Workshop, Directed Energy Professional Society*, 2008.
4. M. Siemens, Q. Li, M. Murnane, H. Kapteyn, and R.G. Yang, and K. Nelson, "Observing quasi-ballistic heat transport with EUV light from HHG", *Fifth Annual Ultrashort Pulse Laser Materials Interaction Workshop, Directed Energy Professional Society*, 2007.
3. R. Tobey, M. Siemens, O. Cohen, M. Murnane, H. Kapteyn, and K. Nelson, "Ultrafast extreme ultraviolet holography: Dynamic monitoring of surface deformation," in *Ultrafast Phenomena XV (P. Corkum, D. Jonas, D. Miller, A.M. Weiner, Eds., Springer Series in Chemical Physics, 2007)* pp. 42-44.
2. R. Tobey, E. Gershgoren, M. Siemens, H. Kapteyn, M. Murnane, T. Feurer, and K. Nelson, "Probing of thermal acoustic transients in materials using EUV radiation," in *Ultrafast Phenomena XIV (T. Kobayashi, T. Okada, T. Kobayashi, K. Nelson, and S. Silvestri, Eds., Springer Series in Chemical Physics, 2005)*, pp. 239-241.
1. R. Tobey, D. Raymondson, E. Gibson, C.-F. Lei, A. Paul, S. Backus, M. Siemens, X. Zhang, M. Murnane, and H. Kapteyn, "Ultrashort-pulse EUV and soft x-ray sources based on high harmonic generation – principles and applications," in *26th International Congress on High speed Photography and Photonics (D. L. Paisley, Ed., SPIE Vol. 5580, 2005)*, pp. 12-17.

Invited Presentations

27. Mark Siemens, "Light with a twist: an introduction to twisted light with orbital angular momentum," NIST Applied Physics Division Seminar, October 2016.
26. Mark Siemens, "Light with a twist: an introduction to twisted light with orbital angular momentum," Colorado State University Physics Department Colloquium, October 2016.
25. Mark Siemens, "Light with a twist: an introduction to twisted light with orbital angular momentum," Florida International University Physics Department Colloquium, May 2016.
24. Mark Siemens, "Light with a twist: an introduction to twisted light with orbital angular momentum," Air Force Academy Physics Department Colloquium, May 2016.
23. Mark Siemens, "2D electronic coherent spectroscopy: basics and application in measuring exciton and phonon interactions," Energy Transport Workshop (RASEI and ICAM), Boulder CO December 2015.
22. Mark Siemens, Samuel Alperin, Robert Niederriter, and Juliet Gopinath, "Simple generation and measurement of twisted light with orbital angular momentum," Four Corners Section of the APS meeting, Tempe AZ, October 2015.
21. Mark Siemens, "2D electronic coherent spectroscopy: basics and application to measure exciton and phonon interactions," Physics department colloquium at the Colorado School of Mines, September 2015.
20. Mark Siemens, Samuel Alperin, and Julia Farrell, "Light with a twist: vortex beams of light from DU to you," All-Campus Lecture, University of Denver, September 2015.
19. Mark Siemens, "2D electronic coherent spectroscopy: basics and application to measure exciton and phonon interactions," Colloquium at National Renewable Energy Laboratory, July 2015.
18. Mark Siemens, "Multidimensional Spectroscopy", 1st annual workshop of the Colorado Ultrafast Photonics Initiative (CUPhI), Winter Park CO, April 2015.
17. Mark Siemens, "Ultrafast Optics at the University of Denver," Front Range Ultrafast group meeting, December 2014.
16. Steven T. Cundiff, Hebin Li, Mark E. Siemens, and Galan Moody, "Determination of System Hamiltonian with Multi-dimensional Spectroscopy", Laser Science XXIX, Orlando FL, Oct 2013.
15. Francesco Banfi, Damiano Nardi, Marco Trevegliati, Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, and Gabriele Ferrini, "Probing Thermomechanics at the Nanoscale: Impulsively Excited Pseudosurface Acoustic Waves in Hypersonic Phononic Crystals", International Congress on Ultrasonics, Singapore, May 2013.
14. Mark Siemens, Galan Moody, Alan Bristow, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, "Exciton coupling dynamics in semiconductor nanostructures," Four Corners Section of the APS meeting, Socorro, NM, October 2012.
13. Mark Siemens, Galan Moody, Alan Bristow, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, "Exciton relaxation and coupling dynamics in a quantum dot/well ensemble," NanoPV workshop at I-CAMP 2012, Boulder, CO, August 2012.
12. Hebin Li, Alan Bristow, Xingcan Dai, Galan Moody, Mark Siemens, and Steven Cundiff, "Optical Multidimensional Fourier Transform Spectroscopy International Laser Physics Workshop (LPHYS), Calgary, Canada, July 2012.
11. Mark Siemens, "Optics and Photonics Research at the University of Denver," Colorado Photonics Industry Association, Boulder, CO, October 2011.
10. S. T. Cundiff, G. Moody, H. Li, A. D. Bristow and M. E. Siemens, "Optical Multidimensional Fourier Transform Spectroscopy of Atomic Vapors and Semiconductors", Fourier Transform

- Spectroscopy, Ontario Canada, July 2011.
9. Mark Siemens, Galan Moody, Alan Bristow, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, "Exitonic relaxation and coupling in semiconductor nanostructures studied with optical 2D Fourier transform spectroscopy", Physical Chemistry and Advanced Spectroscopy group meeting at Los Alamos National Laboratory, May 2011.
 8. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Quasi-ballistic thermal transport from nanoscale interfaces observed using ultrafast coherent soft X-ray beams," SPIE Photonics West 2011, San Francisco, CA, January 2011.
 7. Mark Siemens, Qing Li, Ronggui Yang, Margaret Murnane, Henry C. Kapteyn, Erik Anderson, and Keith Nelson, "Quasi-ballistic thermal transport from nanoscale interfaces," New Laser Scientist Conference, Rochester, NY, October 2010.
 6. Patrik Grychtol, Roman Adam, Chan La-O-Vorakiat, Stefan Mathias, Mark Siemens, Justin Shaw, Hans Nembach, Thomas Silva, Martin Aeschlimann, Claus Schneider, Henry Kapteyn and Margaret Murnane, "Ultrafast and element-selective demagnetization dynamics probed at the M absorption edges employing a table-top soft x-ray source," 2010 IEEE 7th International Symposium on Metallic Multilayers, Berkeley, CA, September 2010.
 5. Mark Siemens, "Coherent excitonic resonances of natural quantum dots studied with optical 2D Fourier transform spectroscopy", Cornell/Jin group meeting at JILA and University of Colorado, May 2010.
 4. Mark Siemens, "Femto-fast and nano-small: Spectroscopy of fundamental carrier dynamics," Colloquium of the Department of Physics and Astronomy, University of Denver, Denver, CO, March 2010.
 3. Mark Siemens, "Nanoscale thermal and acoustic dynamics probed with soft x-ray light," Undergraduate Physics Seminar at the University of Northern Colorado, Greeley, CO, January 2010.
 2. Chan La-O-Vorakiat, Stefan Mathias, Patrik Grychtol, Roman Adam, Mark E. Siemens, Justin M. Shaw, Hans Nembach, Claus M. Schneider, Martin Aeschlimann, Thomas J. Silva, Margaret M. Murnane, and Henry C. Kapteyn, "Ultrafast demagnetization probed at elemental M-edges using tabletop high-order harmonic EUV light," MMM-Intermag, Washington, DC, January 2010.
 1. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Nanoscale Heat Transport Probed with Soft-X-Rays," OSA Conference on Lasers and Electro-optics/ Quantum Electronics and Laser Science, San Jose, CA, May 2008. Paper CWA6.

Contributed Presentations

74. Brian Green and Mark Siemens, "Transient thermorefectance in spherical coordinates," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, October 2016. Poster presentation.
73. Samuel Alperin, Robert Niederriter, Juliet Gopinath, and Mark Siemens, "Measuring Orbital Angular Momentum of Light With a Single, Stationary Lens," Frontiers in Optics/Laser Science Conference, Rochester, NY, October 2016. Poster presentation.
72. Robert Niederriter, Samuel Alperin, Mark Siemens, and Juliet Gopinath, "Generation of tunable orbital angular momentum in polarization maintaining fiber," Frontiers in Optics/Laser Science Conference, Rochester, NY, October 2016.
71. Brian Green and Mark Siemens, "Transient thermorefectance measurement of gold nanoparticle thermal boundary resistance," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, November 2015. Poster presentation.

70. Cameron Hickert, Bradley Becker, Mark Siemens, and Xin Fan, "Nanoscale Interface Interaction with Magneto-Optical Kerr Effect (MOKE)," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, November 2015. Poster presentation.
69. Samuel Alperin, Mark Siemens, Robert Niederriter, and Juliet Gopinath, "Measuring Orbital Angular Momentum of Light With a Single, Stationary Lens," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, November 2015. Poster presentation.
68. John Maurer, Brian Green, and Mark Siemens, "Ultrafast Pump-Probe Measurement of Media Dependent Exciton Lifetimes in Lead Sulfide Quantum Dots," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, November 2015. Poster presentation.
67. Cameron Hickert, Bradley Becker, Mark Siemens, and Xin Fan, "Nanoscale Interface Interaction with Magneto-Optical Kerr Effect (MOKE)," Four Corners Section of the APS meeting, Tempe AZ, October 2015. Poster presentation.
66. John Maurer, Brian Green, and Mark Siemens, "Ultrafast Pump-Probe Measurement of Media Dependent Exciton Lifetimes in Lead Sulfide Quantum Dots," Four Corners Section of the APS meeting, Tempe AZ, October 2015. Poster presentation.
65. Brian Green and Mark Siemens, "Transient thermoreflectance measurement of gold nanoparticle thermal boundary resistance," Four Corners Section of the APS meeting, Tempe AZ, October 2015.
64. Joshua Bell, Rebecca Conrad, and Mark Siemens, "Analytical Calculation of two-dimensional spectra," Fundamental Optical Processes in Semiconductors (FOPS) – 2015, Breckenridge CO, August 2015. Poster presentation.
63. Geoffrey Diederich, Mark Siemens, Bo Sun, Diogo Almeida, and Steven Cundiff, "Exciton-Phonon Interaction Dynamics in Type I Core/Shell Quantum Dots," Fundamental Optical Processes in Semiconductors (FOPS) – 2015, Breckenridge CO, August 2015. Poster presentation.
62. Samuel Alperin, Mark Siemens, Robert Niederriter, and Juliet Gopinath, "Measuring Orbital Angular Momentum of Light With a Single, Stationary Lens," OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2015. Poster presentation.
61. Robert Niederriter, Mark Siemens, and Juliet Gopinath, "Fiber Optic Sensors Based on Orbital Angular Momentum," OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2015.
60. Geoffrey Diederich, Mark Siemens, Bo Sun, Diogo Almeida, and Steven Cundiff, "Exciton-Phonon Interaction Dynamics in Type I Core/Shell Quantum Dots", 1st annual workshop of the Colorado Ultrafast Photonics Initiative (CUPhI), Winter Park CO, April 2015. Poster presentation.
59. Joshua Bell, Rebecca Conrad, and Mark Siemens, "Analytical Calculation of two-dimensional spectra," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, Oct. 2014. Poster presentation.
58. Geoffrey Diederich and Mark Siemens, "Calculation of Phonon-Exciton Coupling for Spectroscopy of Semiconductor Quantum Dots," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, Oct. 2014. Poster presentation.
57. Rohan Singh, Galan Moody, Mark Siemens, Hebin Li, and Steven Cundiff, "Spectral Diffusion of Excitons in Disordered GaAs Quantum Wells," OSA Quantum Electronics and Laser Science (CLEO/QELS), Baltimore, MD, June 2014.
56. Brian Green, Sarah Mason, Barry Zink, and Mark Siemens, "Nanoscale thermal transport measurements: Bridging ultrafast and steady-state," 2014 APS March Meeting, Denver, CO,

March 2014.

55. Rohan Singh, Galan Moody, Mark Siemens, Hebin Li, and Steven Cundiff, "Effect of Disorder on Spectral Diffusion in GaAs Quantum Wells Studied Using Two-Dimensional Coherent Spectroscopy," 2014 APS March Meeting, Denver, CO, March 2014.
54. Hebin Li, Alan Bristow, Mark Siemens, Galan Moody, Steven Cundiff, "Optical three-dimensional coherent spectroscopy," SPIE Photonics West, San Francisco, CA, Feb. 2014.
53. Brian Green, Sarah Mason, Barry Zink, and Mark Siemens, "Nanoscale thermal transport measurements: Bridging ultrafast and steady-state," 2013 Meeting of the 4 Corner Section of the American Physical Society, Denver, CO, Oct. 2013.
52. Rebecca Conrad and Mark Siemens, "Analytical modeling of line shapes in multidimensional spectroscopy," 2013 Meeting of the 4 Corner Section of the American Physical Society, Denver, CO, Oct. 2013. Poster presentation.
51. Robert Niederriter, Juliet Gopinath, and Mark Siemens, "Variable-focus method for characterizing general astigmatic laser beams," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, Oct. 2013. Poster presentation.
50. Brian Green and Mark Siemens, "Ultrafast thermal transport measured in isolated microscale bridges," Annual Meeting of the Colorado Photonics Industry Association, Boulder, CO, Oct. 2013. Poster presentation.
49. Rohan Singh, Galan Moody, Mark Siemens, Hebin Li, and Steven Cundiff, "Excitonic Frequency-Frequency Correlation Functions in a GaAs Quantum Well," OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, June 2013.
48. Robert Niederriter, Juliet Gopinath, and Mark Siemens, "Variable-focus method for characterizing general astigmatic laser beams," OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, June 2013.
47. Damiano Nardi, Marco Trevegliati, Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, and Gabriele Ferrini, "Impulsively Excited Pseudosurface Acoustic Waves in Hypersonic Phononic Crystals," International Congress on Ultrasonics, Singapore, May 2013.
46. Brian Green and Mark Siemens, "Ultrafast Pump-probe Measurements of Thermal Transport in Nanospheres," Four Corners Section of the APS meeting, Socorro, NM, October 2012.
45. Brian Green, Barry Zink, and Mark Siemens, "Nanoscale thermal transport measurements: Bridging ultrafast and steady-state," Phonons 2012, Ann Arbor, MI, July 2012. Poster presentation.
44. Hebin Li, Galan Moody, Alan Bristow, Mark Siemens, and Steven Cundiff, "Optical Multidimensional Spectroscopy of Atomic Vapor," International Conference on Ultrafast Phenomena (UP), Lausanne, Switzerland, July 2012.
43. Brian Green and Mark Siemens, "Ultrafast transient thermoreflectance measurements of thermal transport in nanostructures," Conference on Earth and Energy Research, March 2012. Poster presentation.
42. Hebin Li, Alan Bristow, Mark Siemens, Galan Moody, and Steven Cundiff, "Experimental determination of full Hamiltonian via 3D Fourier-transform spectroscopy," 2011 APS March Meeting, Boston, MA, Feb. 2012.
41. Galan Moody, Mark Siemens, Alan Bristow, Xingan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, "Revealing exciton dephasing and transport dynamics in semiconductor quantum well – quantum dot systems using optical 2D Fourier transform spectroscopy," SPIE Photonics West 2011, San Francisco, CA, January 2012.
40. Brian Green and Mark Siemens, "Ultrafast thermoreflectance measurements of thermal transport

- in nanostructures”, Colorado Photonics Industry Association, Boulder, CO, October 2011. Poster presentation.
39. Hebin Li, Alan Bristow, Mark Siemens, Galan Moody, and Steven Cundiff, “Experimental determination of full Hamiltonian via 3D Fourier-transform spectroscopy,” Gordon Conference on Quantum Control of Light and Matter, South Hadley, MA, July 2011.
 38. Qing Li, Kathleen Hoogeboom-Pot, Mark Siemens, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, Olav Hellwig, Bruce Gurney, Keith Nelson, “Generation and Detection of Very Short-Wavelength Surface Acoustic Waves at Nano-interfaces,” OSA Quantum Electronics and Laser Science (CLEO/QELS), Baltimore, MD, May 2011.
 37. Hebin Li, Alan Bristow, Mark Siemens, Galan Moody, and Steven Cundiff, “Three-dimensional Fourier-transform spectroscopy of potassium vapor,” 2011 APS March Meeting, Dallas, TX, March 2011.
 36. Galan Moody, Hebin Li, Mark Siemens, and Steven Cundiff, “Three-dimensional Fourier-transform spectroscopy of potassium vapor,” 2011 APS March Meeting, Dallas, TX, March 2011.
 35. Hebin Li, Alan Bristow, Mark Siemens, Galan Moody, and Steven Cundiff, “Phase cycling for optical two-dimensional Fourier-transform spectroscopy,” 2011 APS March Meeting, Dallas, TX, March 2011.
 34. Steven Cundiff, Alan Bristow, Tianhao Zhang, Mark Siemens, Richard Mirin “Using 2D Fourier-transform spectroscopy to separate homogeneous and inhomogeneous line widths of heavy- and light-hole excitons in weakly disordered semiconductor quantum wells,” 2011 APS March Meeting, Dallas, TX, March 2011.
 33. Mark Siemens, Galan Moody, Hebin Li, Alan Bristow, and Steven Cundiff, “Resonance Lineshapes In Two-dimensional Fourier Transform Spectroscopy,” Frontiers in Optics/Laser Science, Rochester, NY, October 2010.
 32. Alan Bristow, Galan Moody, Mark Siemens, Xingcan Dai, Denis Karaickaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, “Coherent Linewidths of Interfacial GaAs Quantum Dot Excitons and Incoherent Coupling from Quantum Well Excitons,” Frontiers in Optics/Laser Science, Rochester, NY, October 2010.
 31. Hebin Li, Xingcan Dai, Alan Bristow, Mark Siemens, Denis Karaickaj, and Steven Cundiff, “Multi-dimensional Fourier-transform spectroscopy of potassium vapor,” Coherent Multidimensional Spectroscopy, Minneapolis, MN, August 2010. Poster Presentation.
 30. Mark Siemens, Galan Moody, Hebin Li, Alan Bristow, and Steven Cundiff, “Resonance lineshapes in two-dimensional Fourier transform spectroscopy,” Coherent Multidimensional Spectroscopy, Minneapolis, MN, August 2010. Poster Presentation.
 29. S. Mathias, C. La-O-Vorakiat, P. Grychtol, R. Adam, M. Siemens, J.M. Shaw, H. Nembach, M. Aeschlimann, C. M. Schneider, T. Silva, M.M. Murnane, H. C. Kapteyn, "Ultrafast, Element-Specific, Demagnetization Dynamics Probed using Coherent High Harmonic Beams," 7th International Symposium on Ultrafast Surface Dynamics (USD7), Brijuni Islands National Park, Croatia, August 2010.
 28. Roman Adam, Patrik Grychtol, Chan La-O-Vorakiat, Stefan Mathias, Mark Siemens, Justin Shaw, Hans Nembach, Thomas Silva, Martin Aeschlimann, Claus Schneider, Henry Kapteyn, and Margaret Murnane, “Measurement of demagnetization dynamics at the M edges of Ni and Fe using a tabletop high-harmonic soft X-ray source,” Vacuum UltraViolet and X-Ray Physics, Vancouver, BC, Canada, July 2010.
 27. Stefan Mathias, Chan La-O-Vorakiat, Patrik Grychtol, Roman Adam, Mark Siemens, Justin Shaw, Hans Nembach, Martin Aeschlimann, Claus Schneider, Thomas Silva, Margaret Murnane, and Henry Kapteyn, “Ultrafast, Element-Specific, Demagnetization Dynamics Probed Using

- Coherent High Harmonic Beams,” 17th International Conference on Ultrafast Phenomena, Snowmass, CO, July 2010. Poster Presentation.
26. Galan Moody, Mark Siemens, Alan Bristow, Xingcan Dai, Denis Allan Bracker, Daniel Gammon, and Steven Cundiff, “Linewidth and Coupling of Interfacial GaAs Quantum Dots Measured with Optical Two-Dimensional Fourier Transform Spectroscopy,” 17th International Conference on Ultrafast Phenomena, Snowmass, CO, July 2010.
 25. Qing Li, Mark Siemens, Ronggui Yang, Margaret Murnane, Henry C. Kapteyn, Erik Anderson, and Keith Nelson, “Observation of Quasi-Ballistic Heat Transport at Nano-Interfaces Using Coherent Soft X-Ray Beams,” OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2010.
 24. Chan La-o-vorakiat, Stefan Mathias, Patrik Grychtol, Roman Adam, Mark Siemens, Justin Shaw, Hans Nembach, Martin Aeschlimann, Claus Schneider, Thomas Silva, Margaret Murnane, and Henry Kapteyn, “Ultrafast, Element-Specific, Demagnetization Dynamics Probed Using Coherent High Harmonic Beams,” OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2010.
 23. Galan Moody, Mark Siemens, Alan Bristow, Xingcan Dai, Denis Allan Bracker, Daniel Gammon, and Steven Cundiff, “Temperature-Dependent Coupling of GaAs Quantum Well and Interfacial Quantum Dots Studied with Optical 2D Fourier-Transform Spectroscopy,” OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2010.
 22. Denis Karaiskaj, Galan Moody, Alan Bristow, Mark Siemens, Xingcan Dai, Allan Bracker, Daniel Gammon, and Steven Cundiff, “Homogeneous Linewidth Temperature Dependence of Interfacial GaAs Quantum Dots Studied with Optical 2D Fourier-Transform Spectroscopy,” OSA Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2010.
 21. Alan Bristow, Galan Moody, Mark Siemens, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, “Optical two-dimensional Fourier-transform spectra of a GaAs interfacial quantum dot ensemble,” Quantum Dot 2010, Nottingham, UK, April 2010.
 20. Mark Siemens, Galan Moody, Alan Bristow, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, “Coherent excitonic resonances of natural quantum dots studied with optical 2D Fourier transform spectroscopy”, 2010 APS March Meeting, Portland, OR, March 2010.
 19. Stefan Mathias, Chan La-O-Vorakiat, Mark Siemens, Margaret Murnane, Henry Kapteyn, Martin Aeschlimann, Patrik Grychtol, Roman Adam, Claus Schneider, Justin Shaw, Hans Nembach, Thomas Silva, “Element-selective magnetization dynamics probed using ultrafast soft x-ray beams”, 2010 APS March Meeting, Portland, OR, March 2010.
 18. Mark Siemens, Galan Moody, Alan Bristow, Xingcan Dai, Denis Karaiskaj, Allan Bracker, Daniel Gammon, and Steven Cundiff, “Energy relaxation and coupling between excitonic resonances in semiconductor nanostructures studied with optical 2D Fourier transform spectroscopy,” Gordon Conference on Ultrafast Phenomena in Cooperative Systems, Galveston, TX, February 2010. Poster Presentation. This poster won a “Young Investigator Award” and was upgraded to a talk.
 17. Chan La-O-Vorakiat, Stefan Mathias, Patrik Grychtol, Roman Adam, Mark E. Siemens, Justin M. Shaw, Hans Nembach, Claus M. Schneider, Martin Aeschlimann, Thomas J. Silva, Margaret M. Murnane, and Henry C. Kapteyn, “Ultrafast demagnetization probed at elemental M-edges using tabletop high-order harmonic EUV light,” Gordon Conference on Ultrafast Phenomena in Cooperative Systems, Galveston, TX, February 2010. Poster Presentation.
 16. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, and Keith Nelson, “EUV Detection of High-Frequency Surface Acoustic Waves”, Fall 2009 Meeting

- of the Four Corners Section of the APS, Golden, CO, October 2009.
15. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, and Keith Nelson, "Time-resolved quasi-ballistic heat transport at nano-interfaces", Fall 2009 Meeting of the Four Corners Section of the APS, Golden, CO, October 2009. Presented by Qing Li. This talk won "Outstanding Student Paper" award.
 14. Galan Moody, Alan Bristow, Mark Siemens, Xingcan Dai, Denis Karaiskaj, Rich Mirin, and Steven Cundiff, "Excitonic energy relaxation in a GaAs/AlGaAs quantum well heterostructure", Fall 2009 Meeting of the Four Corners Section of the APS, Golden, CO, October 2009. Presented by Galan Moody.
 13. Chan La-O-Vorakiat, Stefan Mathias, Patrik Grychtol, Roman Adam, Mark E. Siemens, Justin M. Shaw, Hans Nembach, Claus M. Schneider, Martin Aeschlimann, Thomas J. Silva, Margaret M. Murnane, Henry C. Kapteyn, "Ultrafast Demagnetization Probed at Elemental M-Edges Using Tabletop High-Order Harmonic EUV Light", San Jose, CA, Frontiers in Optics 2009, October 2009. Postdeadline presentation.
 12. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, and Keith Nelson, "Time-resolved quasi-ballistic heat transport at nano-interfaces", 2009 ASME Summer Heat Transfer Conference, San Francisco, CA, July 2009. Presented by Qing Li.
 11. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, and Keith Nelson, "Time-resolved quasi-ballistic heat transport at nano-interfaces", Symposium on Thermophysical Properties, Boulder, CO, June 2009.
 10. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Erik Anderson, and Keith Nelson, "EUV Detection of High-Frequency Surface Acoustic Waves" OSA Conference on Lasers and Electro-optics/ Quantum Electronics and Laser Science (CLEO/QELS), Long Beach, CA, May 2009.
 9. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Probing Quasi-Ballistic Heat Transport using Coherent EUV Beams," Directed Energy Professional Society Ultrashort Pulse Laser Workshop, Boulder, CO, September 2008.
 8. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Nanoscale Heat Transport Probed with Ultrafast Soft X-Rays," Workshop on Efficient Conversion of Solar Energy to Electricity and Fuels, Boulder, CO, August 2008. Poster presentation.
 7. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Nanoscale Heat Transport Probed with Ultrafast Soft X-Rays," 16th International Conference on Ultrafast Phenomena, Stresa Italy, June 2008. Presented by Margaret Murnane. Poster presentation.
 6. Mark Siemens, Qing Li, Ra'anana Tobey, Oren Cohen, Margaret Murnane, Henry Kapteyn, Ronggui Yang, and Keith Nelson, "Ultrasensitive, Ultrafast Holographic Detection of Thermal Transients with Extreme Ultraviolet Radiation," Gordon Conference on Photothermal Spectroscopy, Ventura, CA, Feb 2008. Poster presentation.
 5. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Keith A. Nelson, "Observing quasi-ballistic heat transport with EUV light from HHG," Directed Energy Professional Society Ultrashort Pulse Laser Materials Interaction Workshop, Boulder, CO, October 2007.
 4. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Keith A. Nelson, "Observing heat transport in the quasi-ballistic regime using ultrafast EUV diffraction," Ultrafast Optics / High Field Short Wavelength Conference, Bishop's Lodge, Santa Fe, NM, Sept. 2007. Presented by Qing Li.

3. Mark Siemens, Oren Cohen, Qing Li, Margaret Murnane, Henry Kapteyn, Ra'anan Tobey, and Keith Nelson, "Ultrafast Extreme Ultraviolet Holography: Dynamic Measurement of Surface Deformation," 2007 March Meeting of the American Physical Society, Denver, CO, March 8, 2007. Talk U23.00004.
2. Mark Siemens, Ra'anan Tobey, Oren Cohen, Margaret Murnane, Henry Kapteyn, and Keith Nelson, "Transient 1D holographic detection of surface waves/displacement with extreme ultraviolet radiation," OSA Conference on Lasers and Electro-optics/ Quantum Electronics and Laser Science (CLEO/QELS), Long Beach, CA, May 2006. Paper QMH6.
1. Mark Siemens, Ra'anan Tobey, Oren Cohen, Margaret Murnane, Henry Kapteyn, and Keith Nelson, "High frequency photo-acoustic spectroscopy: 4-wave mixing with extreme ultraviolet radiation," Retreat of the NSF Engineering Research Center in EUV Science and Technology, Estes Park, CO, February 2005.