Amelia (Amy) G. VanEngen Spivey

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University of Puget Sound
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Research Interests

Experimental ultrafast optics and laser physics, semiconductor physics

Professional Experience

2017 – present	Professor of Physics, University of Puget Sound, Tacoma, WA
2011- 2017	Associate Professor of Physics, University of Puget Sound, Tacoma, WA
2005-2011	Assistant Professor of Physics, University of Puget Sound, Tacoma, WA
2003-2005	Post-doctoral Research Scholar, University of Alabama at Birmingham
2004	Adjunct Instructor, Physics, University of Alabama at Birmingham
2003-2004	Adjunct Assistant Professor, Physics, Samford Univ., Birmingham, AL
1999	Consultant / Intern, Advanced Photonics Research Dept., Bell Labs, Lucent Technologies, Holmdel, NJ
2000	Graduate Teaching Assistant, Physics, University of Colorado - Boulder
1997	Graduate Teaching Assistant, Physics, University of Colorado - Boulder
1996-2003	Graduate Research Assistant, JILA, University of Colorado at Boulder
1996	Research Assistant, Computational AMO Physics Summer School, Los Alamos National Laboratory
1995	Undergraduate Research Asst., Physics, NSF REU Program, Lehigh Univ.
1994	Undergraduate Research Asssistant, Physics, NSF REU Program, New Mexico Institute of Mining and Technology
1993-1996	Undergraduate Teaching Assistant, Physics, Westmont College

Education

Ph.D., Physics, University of Colorado at Boulder, January 2003. Thesis: *From transient measurements of exciton dephasing to broad bandwidth optics: exploring physics on both sides of Heisenberg's time-frequency duality* (Steven Cundiff, advisor)

M.S., Physics, University of Colorado at Boulder, May 1999.

B.S. *summa cum laude*, Engineering Physics, Westmont College, Santa Barbara, CA, May 1996.

Certifications and Other Education

Certificate of Completion, *Circuits and Electronics 6.002x*, online course offered by MITx through EdX, June 2012
Graduate Teacher Program, University of Colorado at Boulder, 2003
Optical Sciences and Engineering Program, University of Colorado at Boulder, 2003

Professional Society Memberships

American Association of Physics Teachers
American Physical Society
Optical Society of America
Society of Physics Students

Grants and Awards

M.J. Murdock Charitable Trust 2015262:MNL:2/25/2016, 2016-2018, *Collaborative Research Alliance – to support physical science research and discovery*, with co-PIs from three other institutions. $240,000
Tacoma Public Utilities Community Support Grant, 2014, *Sparking Imaginations Exhibit*, with Prof. Amy Fisher. $2000
Presidential Discretionary Fund, University of Puget Sound, 2013, *Sparking Imaginations Exhibit*, with Prof. Amy Fisher. $1500
Faculty Research Grant, University Enrichment Committee, U. of Puget Sound, 2012. $1996
Mellon Junior Sabbatical Fellowship, University of Puget Sound, Fall 2009
Distinguished Traveling Lecturer Program grant, Division of Laser Science, American Physical Society, 2009
Conference Travel Grants, Univ. of Puget Sound Enrichment Committee (2007, 2010, 2012, and 2014)
Postdoctoral Career Enhancement Award, Univ. of Alabama at Birmingham, 2004
Verona Walker Award, Dean's Small Grants Program, University of Colorado at Boulder, 1998
New Focus Graduate Student Travel Grant to Conference on Lasers and Electro-optics 1998
Engineering Physics Graduate of the Year, Westmont College, 1996

Proposals submitted (unfunded)

Collaborative Research: RUI: Optimization of Light Harvesting for Chemical Conversion Using Luminescent Solar Concentrators and Photocatalysis, submitted to National Science Foundation, October 2017. Collaborators: Andrea Munro, David Patrick, Mark Bussell

Courses Taught

University of Puget Sound (2005 - present)

Empowering Technologies: Energy in the 21st Century (Physics 108)
Empowering Technologies: Energy in the 21st Century (Seminar in Scholarly Inquiry 1 108)
Empowering Technologies: Energy in the 21st Century (Seminar in Scholarly Inquiry 2 108)
General College Physics I Laboratory (Physics 111)
General College Physics II Laboratory (Physics 112)
General University Physics I with Calculus (Physics 121)
General University Physics I Laboratory (Physics 121)
General University Physics II with Calculus (Physics 122)
General University Physics II Laboratory (Physics 122)
Waves and Optics with Laboratory (Physics 212)
Modern Physics I with Laboratory (Physics 221)
Modern Physics II with Laboratory (Physics 222)
Circuits and Electronics with Laboratory (Physics 231)
Analytical Mechanics (Physics 305)
Statistical Mechanics and Thermodynamics (Physics 310)
Electromagnetic Theory I (Physics 351)
Electromagnetic Theory II (Physics 352)
Directed Research (Physics 390)

University of Alabama at Birmingham (2004)

Preparatory Physics (Physics 100)

Samford University (2003-2004)

General Physics I Laboratory (Physics 203)
General Physics II with Calculus (Physics 204)
General Physics II Laboratory (Physics 204)

Senior Honors Theses Supervised

1. Jordan Fonseca '18, *Studying fluorescence from nanocrystals with varying geometry and composition* (2017-2018)

Student Research Projects Supervised

10. Patrick Wigger '19, *Measuring the optical properties of ligands and quantum dots for use in luminescent solar concentrators* (Summer 2018)

9. Julian Long '20, *Measuring the effects of ligand length on fluorescence lifetimes of CdSe/ZnS colloidal quantum dots* (Summer 2018)

8. Patrick Zimmerman '19, *Modeling geometries to couple fluorescence from luminescent solar concentrators into fiber optic cables* (Summer 2017)

7. Cory Koehler '19, *Measurement of the fluorescence lifetimes of colloidal CdSe quantum dots with thiol capping ligands* (Summer 2017)

6. Jessy Hosken '18, *Measuring the effects of ligands on the fluorescence lifetimes of quantum dots for use in luminescent solar concentrators* (Summer 2017)

5. Jordan Fonseca '18, *Construction and testing of ultrafast spectroscopy setup to probe luminescence dynamics for the development of luminescent solar concentrators* (Summer 2016)

4. David Clausen '13, *Reversed refraction: negative index metamaterials for microwaves* (Summer 2012)

3. Nathanael Seid '10, *Dispersion measurements of dye solutions using a white light Michelson interferometer* (Summer 2009)

2. Sara Beck '08, *Dispersion measurements using a white light Michelson interferometer* (Summer 2007)

1. Conner Swarthout '07, *Underwater noise pollution in the Puget Sound* (Summer 2006)

University Service (selected)

Accreditation Review Committee, Univ. of Puget Sound 2018 - present
Secretary of the Faculty, Univ. of Puget Sound 2015-2017
Selection committee, Summer Science Research Program, Univ. of Puget Sound 2007, 2010, 2012, 2014, 2016, 2017
Professional Standards Committee, Univ. of Puget Sound 2014-2015
Member of leadership team for faculty development workshop, "Teaching Writing in the Scientific and Quantitative Fields," Univ. of Puget Sound Summer 2014
Graduate Fellowships Advisory Committee, Univ. of Puget Sound 2008-2009, 2012-2014, 2018-2019
Faculty Senate, University of Puget Sound 2010-2013
Burlington Northern First-Year Seminar Working Group, Univ. of Puget Sound Summer 2011 – May 2012
University Enrichment Committee, Univ. of Puget Sound 2006-2009 (Chair, Spr. 2009)
Exec. Board of Post-doctoral Assoc., Univ. of Alabama, Birmingham 2004 - 2005
Graduate Studies Committee, Physics Dept., Univ. of Colorado 2000 - 2001
JILA Program Review Committee, University of Colorado 1998 - 1999

Professional Service

Chair, Local organizing committee, 19th Annual Meeting of the Northwest Section of the American Physical Society, University of Puget Sound, Tacoma, WA May 31 – June 2, 2018

Panelist at Professional Women's Night, American Assoc. of University Women Tech Trek science camp for girls, Pacific Lutheran University, Parkland, WA 2016, 2018

Member-at-large, Executive Committee of Northwest Section of American Physical Society 2014 – 2017

Reviewer, *The Physics Teacher* 2017

Reviewer, *American Journal of Physics* 2012 - present

Editor, American Physical Society Division of Laser Science Newsletter 2009 – 2015

Reviewer, *Optics Letters* 2014

Reviewer, *Optical Materials Express* 2013

Panel discussant, "Fossil Fuels Forum", Univ. of Puget Sound Nov. 28, 2011

Reviewer, *Optics Express* 2006

Local organizing committee member and webmaster, Eighth Annual Meeting of the Northwest Section of the American Physical Society, held at the University of Puget Sound, May 19-20, 2006

Reviewer, *Applied Optics* 2005

Reviewer, *Journal of the Optical Society of America B* 2004

Judge, Graduate Student Research Day, Univ. of Alabama at Birmingham 2004

Judge, Science Fair at the Altamont School, Birmingham, AL 2004, 2005

Judge, Alabama State Science Olympiad 2003, 2004

Reviewer, Cooperative Grants Program, U.S. Civilian Research and Development Foundation 2001

Refereed Publications (* denotes undergraduate co-author)

12. A.G. VanEngen Spivey. Group velocity dispersion of CdSSe/ZnS core/shell colloidal quantum dots. *Optics Communications* **363**, 31-36 (2016).

11. A.G. VanEngen Spivey and Nathanael Seid*. Group velocity dispersion of dyes in solution measured with white-light interferometry. *Applied Optics* **50**, 194-202 (2011).

10. A.G. VanEngen Spivey, C.N. Borca, and S.T. Cundiff. Correlation coefficient for dephasing of light-hole excitons and heavy-hole excitons in GaAs quantum wells. *Solid State Communications* **145**, 303-307 (2008).

9. A.G. VanEngen Spivey and S.T. Cundiff. Inhomogeneous dephasing of heavy-hole and light-hole exciton coherences in GaAs quantum wells. *Journal of the Optical Society of America B* **24**, 664-670 (2007).

8. R.D. Myrex, A.G. VanEngen Spivey, G.M. Gray, and C.M. Lawson. Synthesis and characterization of transition metal systems containing phosphino-oligothiophene ligands for nonlinear optical materials. *Organometallics* **25**, 5045-5050 (2006).

7. A.G. VanEngen Spivey, Vladimir V. Fedorov, Michael M. McKerns, Sergey B. Mirov, and Christopher M. Lawson. Amplification of narrow line LiF:F_2^{+**} color center laser oscillation. *Optics Communications* **254**, 290-298 (2005).

6. J. Melissa Floyd, Gary M. Gray, Amelia G. VanEngen Spivey, Christopher M. Lawson, Timothy M. Pritchett, Michael J. Ferry, Robert C. Hoffman, and Andrew G. Mott. Synthesis, X-ray crystal structures and linear and nonlinear optical characterization of a series of nickel(II) and copper (II) salicylaldiminato complexes. *Inorganica Chimica Acta* **358**, 3773-3785 (2005).

5. A.G. VanEngen Spivey and S.T. Cundiff. Brewster's angle attenuator for terahertz pulses. *Applied Optics* **41**, 7637-7643 (2002).

4. B. Golubovic, R.R. Austin, M.K. Steiner-Shepard, M.K. Reed, Scott A. Diddams, D.J. Jones, and Amelia G. Van Engen. Double Gires-Tournois interferometer negative-dispersion mirrors for use in tunable mode-locked lasers. *Optics Letters* **25**, 275 (2000).

3. A.A. Zozulya, S.A. Diddams, A.G. Van Engen, and T.S. Clement. Propagation dynamics of intense femtosecond pulses: Multiple splittings, coalescence, and continuum generation. *Physical Review Letters* **82**, 1430 (1999).

2. A.G. Van Engen, S.A. Diddams, and T.S. Clement. Dispersion measurements of water with white-light interferometry. *Applied Optics* **37**, 5679-5686 (1998).

1. Y.S. Cheng, T.R. Chen, P.T. Wasiolek, and A. Van Engen. Radon and radon progeny in the Carlsbad Caverns. *Aerosol Science and Technology* **26**, 74-92 (1997).

Other Publications

4. C.N. Borca, Amelia G. VanEngen Spivey, and Steven T. Cundiff. Anomalously fast decay of the LH-HH exciton Raman coherence. *Physica Status Solidi B* **238**, 521 (2003).

3. H.K. Eaton, S.A. Diddams, A.A. Zozulya, A.G. Van Engen, and T.S. Clement. Instantaneous and noninstantaneous nonlinear effects in femtosecond pulse propagation. *Proc. SPIE* **3609**, 152-160 (1999).

2. A.G. Van Engen, S.A. Diddams, and T.S. Clement. Dispersion measurements of water with white-light interferometry: errata. *Applied Optics* **38**, 2499 (1999).

1. S.A. Diddams, A.A. Zozulya, H. Eaton, A.G. Van Engen, and T.S. Clement. Unraveling the mysteries of intense femtosecond pulse propagation. *Optics and Photonics News* **9**, No. 12, 37 (1998).

Exhibits Organized

1. A. Fisher and A.G.V. Spivey, S*parking Imaginations,* Exhibit in Collins Memorial Library at the University of Puget Sound - October 26, 2014, to January 15, 2015 (See http://www.pugetsound.edu/sparkingimaginations for details.)

Invited Presentations and Colloquia

23. "Outcomes of the summer science research student survey: Where to go from here?" with Dr. Kena Fox-Dobbs, Thompson Hall Science and Mathematics Seminar, University of Puget Sound, February 7, 2019

22. "How many physicists does it take to change a light bulb?" Ideas as Work and Play, Student Orientation, University of Puget Sound, Aug. 26 and Aug. 28, 2015

21. "*Sparking Imaginations*: an exhibit on the history and technology of electricity and electrical power," with Dr. Amy Fisher, Thompson Hall Science and Mathematics Seminar, University of Puget Sound, October 30, 2014

20. "Measuring dispersion in dye solutions using white light interferometry," Thompson Hall Science and Mathematics Seminar, University of Puget Sound, Sept. 30, 2010

19. "My life after JILA: teaching and researching at a small college," Life After JILA Seminar Series, JILA, University of Colorado, Boulder, CO, June 11, 2010

18. "Black holes, wormholes, and event horizons," Summer Science Research Seminar, University of Puget Sound, July 17, 2009

17. "Dispersion measurements in materials using white light interferometry," Physics Department Seminar, Reed College, Portland, OR, February 18, 2009

16. "Phase decoherence of semiconductor excitons: using nonlinear optics to probe an ensemble of oscillators," Condensed Matter and Atomic Physics Seminar, Department of Physics, University of Washington at Seattle, December 4, 2007

15. "Bending light backwards: negative indices of refraction," University of Puget Sound Physics Club Lecture, September 25, 2007

14. "Dephasing of light hole and heavy hole excitons in GaAs quantum wells," Invited presentation at the Annual Meeting of the Northwest Section, American Physical

Society, Pocatello, Idaho, May 17-19, 2007

13. "A tutorial on lasers and their applications in ultrafast optics" - Thompson Hall Science and Math Seminar, University of Puget Sound, January 19, 2006

12. "Nonlinear optical studies of organometallic molecules" – Department of Physics, Samford University, Birmingham, AL, March 2005

11. "Nonlinear optical studies of organometallic molecules" – Department of Physics, Goucher College, Baltimore, MD, February 2005

10. "Nonlinear optical studies of organometallic molecules: toward improved nonlinear absorption" – Department of Physics, University of Puget Sound, January 2005

9. "Nonlinear optical studies of organometallic molecules" – Department of Physics, Valparaiso University, Valparaiso, IN, January 2005

8. "Nonlinear optical studies of organometallic molecules: toward improved nonlinear absorption" – Department of Physics, Hanover College, Hanover, IN, January 2005

7. "Absorbers: the fast and the furious, or Engineering molecular structure for applications in nonlinear optics" – Department of Chemistry, Samford University, Birmingham, AL, October 2004

6. "Phase decoherence of semiconductor excitons: using nonlinear optics to probe an ensemble of oscillators" – Department of Physics, University of Alabama at Birmingham, October 2003

5. Wenfang Sun, Michael M. McKerns, Amelia G.V. Spivey, Wei Qui, Christopher M. Lawson, and Gary M. Gray, "Nonlinear optics and power limiting in expanded porphyrin-like metal complexes," presented at the International Symposium on Optical Power Limiting, Sedona, AZ – Sept. 28 to Oct. 3, 2003

4. "Laser Safety with High-Power and Pulsed Sources" – joint presentation with Dr. Sterling Backus, JILA, University of Colorado at Boulder, August 2000

3. "Measuring optical dispersion of materials with a white light Michelson interferometer" Natural Science Research Seminar, Westmont College, March 1998

2. "Normal, surface, and anomalous light-induced drift effects of potassium in noble gases, "Natural Science Research Seminar, Westmont College, November 1995

1. "Measuring size distributions of radon progeny in central and southern New Mexico," Natural Science Research Seminar, Westmont College, February 1995

Contributed Oral Presentations

10. Amelia G.V. Spivey and Amy Fisher, "*Sparking Imaginations*: a museum-style exhibit on the history of electrical science and electrical power generation," 16th Annual Meeting of the Northwest Section of the American Physical Society, Pullman, WA, May 16, 2015

9. Amelia V. Spivey, "Group velocity dispersion of CdSSe/ZnS core/shell colloidal quantum dots," Frontiers in Optics / Laser Science conference, Tucson, AZ, Oct. 23, 2014

8. Amelia VanEngen Spivey, "Exploring asymmetry in the optical dispersion of dyes in solution near an absorption resonance," 14th Annual Meeting of the Northwest Section of the American Physical Society, Vancouver, British Columbia, Canada, October 20, 2012

7. A.G. VanEngen Spivey and Randy Worland, "Connecting everyday life to theory in the upper-level electricity and magnetism course," American Association of Physics Teachers summer meeting, Portland, OR, July 21, 2010

6. A.G. VanEngen Spivey, C.N. Borca, and S.T. Cundiff, "Anomalously fast decay of LH-HH exciton Raman coherence," Quantum Electronics and Laser Science (QELS) conference, Baltimore, MD, June 1-7, 2003

5. C.N. Borca, A.G. VanEngen Spivey, and S.T. Cundiff, "Measurement of LH-HH Raman coherence using three-beam transient four-wave mixing," March Meeting, American Physical Society, Austin, TX, March 3-7, 2003

4. A.G. VanEngen Spivey and Steven T. Cundiff, "Complete measurement of exciton dephasing using three-beam transient four-wave mixing," Nonlinear Optics and Excitation Kinetics of Semiconductors (NOEKS 7), Karlsruhe, Germany, Feb. 24-28, 2003

3. A.G. VanEngen Spivey and Steven T. Cundiff, "Brewster attenuator for THz pulses,"presented at the Optical Society of America Annual Meeting, Orlando, FL, Sept. 29 – Oct. 3, 2002

2. A.G. Van Engen, S.A. Diddams, and T.S. Clement, "Dispersion measurements of optical materials using white light interferometry," presented at the Conference on Lasers and Electro-Optics (CLEO), San Francisco, CA, May 3-9, 1998

1. Y.S. Cheng, T.R. Chen, M.D. Hoover, G.J. Newton, P.T. Wasiolek, and A. Van Engen, "Radon and radon progeny in the Carlsbad Cavern," presented at the International Symposium on the Natural Radiation Environment (NRE VI), Montreal, Canada, June 5-9, 1995

Contributed Poster Presentations

3. T.M. Pritchett, A.G. Mott, M.J. Ferry, A.G. VanEngen Spivey, Q. Zhao, G.M. Gray, and C.M. Lawson, "Excited state absorption cross-sections of an asymmetric pentaazadentate porphyrin-like cadmium complex," presented at the Conference on Lasers and Electro-Optics (CLEO) and Quantum Electronics and Laser Science (QELS), Long Beach, CA, May 21-26, 2006

2. A.G. VanEngen Spivey, C.N. Borca, and S.T. Cundiff, "Dephasing of the LH-HH exciton Raman coherence in GaAs quantum wells: distinguishing between phonon and carrier scattering," presented at the Conference on Lasers and Electro-Optics (CLEO) and Quantum Electronics and Laser Science (QELS), Baltimore, MD, May 22-27, 2005

1. A.G. VanEngen Spivey and S.T. Cundiff, "Observation and theory of LH and HH exciton coherences and LH-HH non-radiative coherence in GaAs-AlGaAs quantum wells with weak disorder," presented at the Colorado Meeting on Fundamental Optical Processes in Semiconductors (FOPS), Estes Park, CO, August 8-13, 2004