

## Sean J. Bentley

Adelphi Univ., Dept. of Physics  
1 South Ave, Garden City, NY 11530  
516-877-4878 • bentley@adelphi.edu

### Academic Positions:

Adelphi University, Department of Physics

- Associate Professor, September 2009-Present
- Assistant Professor, September 2003-August 2009

Stony Brook University, Department of Physics & Astronomy

- Mentor, Laser Teaching Center, Summer 2016; designed and implemented research and educational program in optics for eight undergraduates

### Administrative Positions:

American Institute of Physics

-Director, Society of Physics Students & Sigma Pi Sigma, July 2014-January 2016

- Directed activities of national physics student society (~6000 members) and national physics honor society (~1500 annual inductees and ~60,000 active members)
- Worked closely with leadership and staff of AIP Member Societies (a network of ten major scientific societies totaling ~120,000 members)
- Wrote six editorials for *The SPS Observer*: “My Successful Null Result” (Winter 2015); “The Physics-Engineering Debate” (Fall 2015); “SPS is Your Village” (Summer 2015); “Physics Needs Research and Balance” (Spring 2015); “Freedom and Physics for All” (Winter 2014); “SPS, Diversity, and You” (Fall 2014)
- Wrote four editorials for *Radiations*: “Impacting Lives” (Spring 2016); “A Few Good Mentors” (Fall 2015); “A Force for Good” (Spring 2015); “You are a Physicist” (Fall 2014)
- Wrote five guest columns for *AIP Matters*: “Student leaders aim for impact at SPS Council Meeting” (11/2/2015); “SPS internships shape future leaders” (9/14/2015); “SPS goes to Washington” (4/13/2015, with Aline McNaull); “Light and inspiration for a better world” (2/23/2015); “Beyond the walls of classrooms” (9/22/2014)
- Wrote a book review for *Physics Today: Networking for Nerds* by Alaina Levine (December 2015; portions reprinted in “Five books that stood out in 2015” segment)
- Led staff of seven full-time, two part-time, and twelve summer interns
- Planned and managed \$2M annual budget and worked actively on development
- Liaised between elected leadership, membership, and staff
- Developed and implemented strategies for memberships, communications, programs, and all aspects of operations to promote undergraduate physics education

### Education:

Ph.D. in Optics, University of Rochester, Rochester, NY, 2004

Thesis: Transverse Effects in Nonlinear and Quantum Optics

M.S. in Electrical Engineering, University of Missouri-Rolla\*, Rolla, MO, 1997

Thesis: Optical Time-of-Flight Magnetic Field Sensor; GPA: 4.0

B.S. in Electrical Engineering with minor in Physics, University of Missouri-Rolla\*, 1995

Divisional Honors Scholar; *Magna Cum Laude*

\*(Now the Missouri University of Science and Technology)

**Patent:**

U.S. Patent No. 7,859,646 B2, Sean J. Bentley, “Interferometric Method for Improving the Resolution of a Lithographic System,” (December 28, 2010).

**Honors & Awards:**

- 2022 David Halliday and Robert Resnick Award for Excellence in Undergraduate Physics Teaching from the American Association of Physics Teachers
- Academy of Electrical & Computer Engineering, Missouri University of Science and Technology (2016)
- Adelphi Teaching Excellence Award, 2013 (Nominee: 2008 & 2009)
- Adelphi Excellence in Faculty Service Award Nominee, 2010, 2011, 2019, & 2020
- Adelphi Excellence in Faculty Scholarship & Creative Work Award Nominee, 2010
- Chancellor’s Fellow, 1995-1997
- IEEE Region 5 Paper Contest—Third Place, 1995
- IEEE UMR Student Branch Outstanding Member, 1994-1995
- Chancellor’s Scholar, 1991-95; Curator’s Scholar, 1991-95; Miner’s Scholar, 1991-95
- National Merit Scholar, 1991

**Book:**

S. J. Bentley, *Principles of Quantum Imaging: Ghost Imaging, Ghost Diffraction, and Quantum Lithography*, Taylor & Francis/CRC Press, Boca Raton, FL, (in progress).

**Book Chapters:**

1. S. J. Bentley, “The Photon Picture of Light,” *Encyclopedia of Modern Optics*, edited by Robert D. Guenther, Duncan G. Steel and Leopold Bayvel, Elsevier, Oxford, 2004 (ISBN 0-12-227600-0).
2. E. M. Nagasako, S. J. Bentley, R. W. Boyd, and G. S. Agarawal, “Nonclassical, Two-Photon Interferometry and Lithography with High-Gain Optical Parametric Amplifiers,” *Coherence and Quantum Optics VIII*, edited by N. P. Bigelow, J. H. Eberly, C. R. Stroud, Jr., and I. A. Walmsley, Springer (Kluwer Academic/Plenum), New York, 2004 (ISBN 0-30-648116-2).

**Magazine Contributions:**

1. Guest Editor, *The Bridge*, **120**, Issue 2 (2024; topical issue on fusion for energy; [https://magazines.ieee.org/hkn/library/page/issue\\_2\\_2024/1/](https://magazines.ieee.org/hkn/library/page/issue_2_2024/1/)).
2. Guest Editor, *The Bridge*, **118**, Issue 3 (2022; topical issue on engineering space technology; [https://www.nxtbook.com/nxtbooks/ieee/bridge\\_issue3\\_2022/](https://www.nxtbook.com/nxtbooks/ieee/bridge_issue3_2022/)).
3. Guest Editor, *The Bridge*, **114**, Issue 1 (2018; topical issue on quantum entanglement and engineering; [http://www.nxtbook.com/nxtbooks/ieee/bridge\\_2018\\_issue1/](http://www.nxtbook.com/nxtbooks/ieee/bridge_2018_issue1/)).
4. S. J. Bentley, “Quantum optics for the 21st century electrical engineer,” *The Bridge*, **110**, 18-23 (2014; pdf of issue).

**Peer-Reviewed Articles (undergraduate authors in bold):**

1. **H. Jalili**, **T. Danza**, **R. Mouradian**, and S. J. Bentley, “Super-resolution patterns in semiconductor nanoparticle films,” (in preparation).
2. S. J. Bentley, **M. Mohacsi**, and **Z. Shafique**, “Physical analysis of bone penetration from spear wounds,” (in preparation).

3. **A. Pizzuto, A. Gifford,** and S. J. Bentley, "Diffraction by two non-coplanar cylinders," (in preparation).
4. **J. Dove,** S. J. Bentley, and **S. Shresthra,** "Double-slit quantum-eraser experiment using momentum-entangled photons," (in preparation).
5. S. J. Bentley and **D. Sofferan,** "High-resolution nonlinear pattern formation," (in preparation).
6. S. J. Bentley and **E. Ochoa-Madrid,** "Acoustical analysis of consonant distortion," (in preparation).
7. E. de Freitas and S. J. Bentley, "Material encounters with mathematics: The case for museum based crosscurricular integration," *International Journal of Educational Research*, **55**, 36-47 (2012).
8. S. E. Watkins, M. A. Huggans, and S. J. Bentley, "Pre-college outreach at a technical conference," *International Journal of Engineering Education*, **25** (3), 436-443, (2009).
9. S. J. Bentley, "Nonlinear interferometric lithography for arbitrary two-dimensional patterns," *Journal of Micro/Nanolithography, MEMS, and MOEMS (JM3)* **7**, 013004 (2008).
10. S. J. Bentley, **C. V. Anderson,** and J. P. Doohar, "Three-photon absorption for nanosecond excitation in cadmium selenide quantum dots," *Optical Engineering* **46**, 128003 (2007); also selected for inclusion in the *Virtual Journal of Nanoscale Science & Technology*.
11. S. J. Bentley, J. E. Heebner, and R. W. Boyd, "Transverse instabilities and pattern formation in two-beam-excited nonlinear optical interactions in liquids," *Optics Letters* **31**, 951 (2006).
12. R. W. Boyd and S. J. Bentley, "Recent progress in quantum and nonlinear optical lithography," *Journal of Modern Optics* **53**, 713 (2006).
13. S. J. Bentley and R. W. Boyd, "Nonlinear optical lithography for ultra-high sub-Rayleigh resolution," *Optics Express* **12**, 5735 (2004).
14. R. W. Boyd, R. S. Bennink, S. J. Bentley, and J. C. Howell, "Image formation using quantum- entangled photons," *Optics & Photonics News, Optics in 2004* December Issue, 39 (2004).
15. J. C. Howell, R. S. Bennink, S. J. Bentley, and R. W. Boyd, "Realization of the Einstein-Podolsky-Rosen paradox using momentum- and position-entangled photons from spontaneous parametric down conversion," *Physical Review Letters* **92**, 210403 (2004).
16. R. S. Bennink, S. J. Bentley, R. W. Boyd, and J. C. Howell, "Quantum and classical coincidence imaging," *Physical Review Letters* **92**, 033601 (2004).
17. R. S. Bennink, S. J. Bentley, and R. W. Boyd, "'Two-photon' coincidence imaging with a classical source," *Physical Review Letters* **89**, 113601 (2002).
18. E. M. Nagasako, S. J. Bentley, R. W. Boyd, and G. S. Agarwal, "Parametric downconversion vs. optical parametric amplification: A comparison of their quantum statistics," *Journal of Modern Optics* **49**, 529 (2002).
19. E. M. Nagasako, S. J. Bentley, R. W. Boyd, and G. S. Agarwal, "Nonclassical two-photon interferometry and lithography with high-gain optical parametric amplifiers", *Physical Review A* **64**, 043802 (2001).
20. S. J. Bentley, R. W. Boyd, W. E. Butler, and A. C. Melissinos, "Spatial patterns induced in a laser beam by thermal nonlinearities," *Optics Letters* **26**, 1084 (2001).
21. G. S. Agarwal, R. W. Boyd, E. M. Nagasako, and S. J. Bentley, *Physical Review Letters* **86**, 1389 (2001)[comment].
22. S. J. Bentley, R. W. Boyd, W. E. Butler, and A. C. Melissinos, "Measurement of

the thermal contribution to the nonlinear refractive index of air at 1064 nm,” Optics Letters **25**, 1192 (2000).

**Professional Presentations (undergraduate authors in bold):**

1. Sean J Bentley, “Optical Fourier Transforms & Phase,” AAPT Winter 2024 Meeting, January 9, 2024, New Orleans, LA.
2. **Zahin Ritee** (Mentor: Sean J Bentley), “Super-Resolution Nonlinear Imaging,” PhysCon: Sigma Pi Sigma 2022 Physics Congress, Washington, DC, October 8, 2022.
3. Sean J Bentley, “Some Pain, Much Gain: bringing evidence-based practices into practice,” Halliday & Resnick Award Talk, AAPT Summer 2022 Meeting, July 12, 2022, Grand Rapids, MI.
4. **Mateo Murillo**, **Zahin Ritee**, and Sean J Bentley, “High-Resolution Nonlinear Imaging,” APS March Meeting 2022, Volume 67, Number 3, Chicago, March 15, 2022: <https://meetings.aps.org/Meeting/MAR22/Session/G00.56>
5. **Amanta A Promi**, Sean J Bentley, and **Shalauni Patel**, “Quantum Optical Magnetic Field Sensor,” APS March Meeting 2022, Volume 67, Number 3, Chicago, March 15, 2022: <https://meetings.aps.org/Meeting/MAR22/Session/G00.62>
6. **Mateo Murillo** and Sean J Bentley, “High-resolution nonlinear pattern formation,” Symposium on Undergraduate Research, Division of Laser Science of the American Physical Society, Laser Science XXXVII, November 1, 2021 (held as interactive remote conference due to COVID): <https://laser.physics.sunysb.edu/research-symposium/2021/2021-program.pdf>
7. **K. Gifford**, **Z. Shafique**, and S. J. Bentley, “Progress on the Development of a Magnetic Field Sensor,” American Physical Society March Meeting, Denver, CO, March 2020\*.
8. **T. Danza**, **R. Mouradian**, **M. Murillo**, and S. J. Bentley, “Arbitrary Super-Resolution Patterns Formed in Quantum Dots,” American Physical Society March Meeting, Denver, CO, March 2020\*.
9. **H. Jalili**, **T. Danza**, **R. Mouradian**, and S. J. Bentley, “Super-Resolution Patterns in Quantum Dots,” American Physical Society March Meeting, Boston, MA, March 2019.
10. **Z. Baig**, **Z. Shafique**, and S. J. Bentley, “Measurements with Position-Momentum Entangled Photons,” American Physical Society March Meeting, Boston, MA, March 2019.
11. **H. Jalili**, **T. Danza**, **R. Mouradian**, and S. J. Bentley, “Nonlinear Interference Pattern Observed in Quantum Dots,” Symposium on Undergraduate Research, Laser Science APS/DLS, Washington, DC, September 2018.
12. **Z. Shafique**, **Z. Baig**, and S. J. Bentley, “Joint Uncertainty of Entangled Photons,” Symposium on Undergraduate Research, Laser Science APS/DLS, Washington, DC, September 2018.
13. **M. Aziz**, **A. Dellarosa**, and S. J Bentley, “Illustrating the differences between a Superposition and a Mixture of States,” American Physical Society March Meeting, Los Angeles, CA, March 2018.
14. **A. Dellarosa**, **M. Aziz**, and S. J Bentley, “High-Resolution Interference Patterns using Nonlinear Absorption,” American Physical Society March Meeting, Los Angeles, CA, March 2018.
15. **A. Dellarosa**, **M. Aziz**, and S. J Bentley, “High-Resolution Interference Patterns Using Nonlinear Absorption,” Symposium on Undergraduate Research, Laser Science APS/DLS, Washington, DC, September 2017.
16. **M. Aziz**, **A. Dellarosa**, and S. J Bentley, “Illustrating The Differences Between a

- Superposition and a Mixture of States,” Symposium on Undergraduate Research, Laser Science APS/DLS, Washington, DC, September 2017.
17. **A. Gifford, A. Pizzuto**, M. G. Cohen, and S. J. Bentley, “Diffraction by Cylinders Offset Parallel to Laser Beam Propagation,” Symposium on Undergraduate Research, Laser Science APS/DLS, Rochester, NY, October 2016.
  18. **M. Stanley, J. Rutledge, M. Lo**, M. G. Cohen, and S. J. Bentley, “Generation and Conversion of Transverse Gaussian Laser Modes,” Symposium on Undergraduate Research, Laser Science APS/DLS, Rochester, NY, October 2016.
  19. **G. Richmond, J. Kurlander**, M. G. Cohen, and S. J. Bentley, “Broad-Spectrum Measurement of Retardation,” Symposium on Undergraduate Research, Laser Science APS/DLS, Rochester, NY, October 2016.
  20. S. J. Bentley, “Quantum Entanglement: The Future is Now,” Keynote Address, Western Pennsylvania American Association of Physics Teachers Spring 2015 Meeting, Grove City, PA, March 2015.
  21. S. J. Bentley, “Basic Science Behind the Headlines,” 2013 American Association of Physics Teachers Winter Meeting, New Orleans, LA, January 2013.
  22. **D. Soffer** and S. J. Bentley, “High-Resolution Interference in Quantum Dot Thin-Films,” Symposium on Undergraduate Research, Laser Science APS/DLS, Rochester, NY, October 2012.
  23. **S. Shrestha** and S. J. Bentley, “Double-Slit Quantum-Eraser Using Momentum-Entangled Photons,” Symposium on Undergraduate Research, Laser Science APS/DLS, Rochester, NY, October 2012.
  24. S. J. Bentley and E. de Freitas, “Increasing Problem-Solving Skills in Introductory High School Physics,” 2012 American Association of Physics Teachers Summer Meeting, Philadelphia, PA, July 2012.
  25. S. J. Bentley, “Real-World Projects for Electronics Courses” workshop, Beyond the First Year Conference, Philadelphia, PA, July 2012.
  26. S. J. Bentley, E. de Freitas, and L. Stemkoski, “Enhanced Problem-based Freshman Physics through High School-Museum Partnerships,” 2011 American Association of Physics Teachers Winter Meeting, Jacksonville, FL, January 2011.
  27. S. J. Bentley, “Complementarity, source coherence, and joint uncertainty,” Optical Society of America 92nd Annual Meeting, Rochester, NY, October 2008.
  28. S. J. Bentley, “Quantum optics round-table teaching,” Quantum Optics/Quantum Engineering for Undergraduates Symposium, Optical Society of America 92nd Annual Meeting, Rochester, NY, October 2008.
  29. S. J. Bentley, “Arbitrary 2-D pattern formation beyond the Rayleigh limit,” Optical Society of America 91st Annual Meeting, San Jose, CA, September 2007.
  30. S. J. Bentley, “Testing complementarity with quantum entangled photons,” Optical Society of America 90th Annual Meeting, Rochester, NY, October 2006.
  31. R. Hixon, S. E. Watkins, S. J. Bentley, and M. A. Huggans, “Student robotics competition using Robolab and Lego Bricks,” Proceedings of the 2006 ASEE Midwest Section Annual Conference, 13-15 September 2006, Kansas City, MO.
  32. S. J. Bentley, **C. V. Anderson**, and J. P. Doohar, “Three-photon absorption in cadmium selenide quantum dots,” Conference on Lasers and Electro-Optics (CLEO), Long Beach, CA, May 2006, CWA6.
  33. S. J. Bentley, **C. V. Anderson**, and J. P. Doohar, “Third-order nonlinearities of CdSe quantum dots,” Optical Society of America 89th Annual Meeting, Tucson, AZ, Oct 2005.
  34. R. W. Boyd, R. S. Bennink, S. J. Bentley, M. N. O’Sullivan-Hale, I. Ali Khan, and J.

- C. Howell, "Progress in quantum lithography and ghost imaging," The Physics of Quantum Electronics XXXV, Snowbird, Utah, January 2-6, 2005. (Invited Talk)
35. R. W. Boyd, R. S. Bennink, S. J. Bentley, M. N. O'Sullivan-Hale, I. Ali Khan, and J. C. Howell, "Image formation using quantum-entangled photons," Imaging at the Limits, Cargese, Corsica, France, September 5-11, 2004. (Invited Talk)
  36. R. W. Boyd, R. S. Bennink, S. J. Bentley, M. N. O'Sullivan-Hale, I. Ali Khan, and J. C. Howell, "Image formation using quantum-entangled photons," International Quantum Electronics Conference, San Francisco, CA, May 16-20, 2004.
  37. S. J. Bentley and R. W. Boyd, "Coherent control of four-wave mixing gain," Laser Science XIX, Tucson, AZ, October 2003.
  38. M. S. Bigelow, S. J. Bentley, A. M. Marino, and R. W. Boyd, "Polarization properties of photons generated by two-beam excited conical emission," Laser Science XIX, Tucson, AZ, October 2003.
  39. S. J. Bentley and R. W. Boyd, "Super-resolution by nonlinear optical lithography," Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, June 2003, CMH4.
  40. R. S. Bennink, S. J. Bentley, R. W. Boyd, and J. C. Howell, "Quantum and classical aspects of coincidence imaging," Quantum Electronics and Laser Science Conference (QELS), June 1-6, 2003, QMH2.
  41. S. J. Bentley, J. E. Heebner, and R. W. Boyd, "High-order spatial modulation instability," Optical Society of America 86th Annual Meeting, Orlando, FL, October 2002.
  42. S. J. Bentley and R. W. Boyd, "Reducing the effect of laser beam filamentation," OPTO-Canada, Ottawa, Canada, May 2002.
  43. E. M. Nagasako, S. J. Bentley, R. W. Boyd, and G. S. Agarwal, "Nonclassical, two-photon interferometry and lithography with high-gain optical parametric amplifiers," Eighth Rochester Conference on Coherence and Quantum Optics, Rochester, NY, June 13-16, 2001.
  44. S. J. Bentley, R. W. Boyd, E. M. Nagasako, and G. S. Agarwal, "Quantum entanglement for optical lithography and microscopy beyond the Rayleigh limit," Quantum Electronics and Laser Science Conference (QELS), May 6-11, 2001, QTuD2.
  45. S. J. Bentley, R. W. Boyd, W. E. Butler, and A. C. Melissinos, "Thermal nonlinearities and pattern formation in high-finesse Fabry-Perot cavities," Optical Society of America 84th Annual Meeting, Providence, RI, October 2000.
  46. S. J. Bentley, R. W. Boyd, W. E. Butler, and A. C. Melissinos, "Measurement of the thermal refractive index of air at 1.064 microns using a cw laser," Nonlinear Optics: Materials, Fundamentals, and Applications, 391-393 (2000).
  47. S. J. Bentley and S. E. Watkins, "Simulation of a coherent heterodyne array imaging system," Optical Society of 80th Annual Meeting, Rochester, NY, October 1996.
  48. S. E. Watkins, R. Gopisetty, S. J. Bentley, and R. A. Anderson, "Target velocity measurements from speckled images," Image Reconstruction and Restoration, Proc. SPIE 2302, 26-35 (1994).
- \* Due to COVID-19 concerns, this meeting was cancelled less than 36 hours prior to scheduled start, but presentations had been accepted and prepared for presentation.

### **Grant Proposals Submitted:**

Awarded to Date (PI or Co-PI\*): \$346,958 (\$335,658 external)

Total Applications (PI or Co-PI\*): \$9,106,222

\* Additional Awards as Senior Personnel and Sub-Contractor also Listed Below

1. *IUSE: Easing Adoption of Evidence Based Practices in Foundational Science Courses,*

- \$406,195, National Science Foundation (Co-PI).
2. MSP: *Science and Math Applied Real-problem Teaching (SMART)*, \$1,499,101, National Science Foundation.
  3. *CLEAN (Composite-Layered-Enhanced-Adjustable-Nanoparticle) Solar Cells: From Fundamental Properties to Working Prototype*, \$100,000, Research Corporation Scialog.
  4. *i3 Development: Science & Math Applied Real-problem Teaching (SMART)*, \$4,518,748, U. S. Department of Education.
  5. *Titanium dioxide/semiconducting nanoparticle/conducting polymer nanowire composites: electrical and optical properties*, \$100,000, Research Corporation Scialog.
  6. MSP-Start: *Science and Math Applied Real-problem Teaching (SMART)*, **\$299,012**, National Science Foundation, **Dec. 2009-Dec. 2012 (awarded)**.
  7. *CCLI-Phase II: Diverse Partnership for Teaching Quantum Mechanics and Modern Physics with Photon Counting Instrumentation*, **\$486,360**, National Science Foundation (Senior Personnel; **awarded**; fund program for Adelphi students in 2012).
  8. *Confocal Laser Microscope & Optical Tweezers*, \$1,900, Adelphi University, 2009 President's Faculty Development Award (**awarded**).
  9. MSP-Start: *Science and Math Applied Real-problem Teaching (SMART)*, \$299,904, National Science Foundation.
  10. *RUI: Development of a Low-Cost, High-Efficiency, Multi-Spectrum Solar Cell (MSSC)*, \$299,476, National Science Foundation (Co-PI).
  11. *The Opportunity Program (TOP)*, **\$620,000**, National Science Foundation, 2007-2012 (Senior Personnel; **awarded**).
  12. *CAREER: Optical Nonlinearities of Semiconductor Nanoparticle/Polymer Composites*, \$530,231, National Science Foundation.
  13. *RUI: Quantification of Nonlocality by Conditioned Positive-Operator-Valued Measurements*, \$234,861, National Science Foundation (Co-PI).
  14. *CAREER: Optical Nonlinearities of Quantum Dot-Based Composites: From Fundamental Quantum Mechanics to Applications in Ultra-high Resolution Lithography*, \$414,596, National Science Foundation.
  15. *Implementation of Positive Operator-Valued Measurements on Photon Polarization States*, \$331,876, National Science Foundation (Co-PI).
  16. *Nonlinear and Quantum Optical Properties of Quantum Dots for Generation of New Sources of Quantum States of Light*, **\$31,146**, Research Corporation Cottrell College Science Award (**awarded**).
  17. *Precollege Outreach in GLOBECOM 2005*, **\$5,500** of \$28,000 total for program, National Science Foundation (Sub-Contract as Pre-college Program Administrator; **awarded**).
  18. *Fundamental Analysis of Quantum Microdots for Potential Applications*, \$4,900, Adelphi University, 2005 President's Faculty Development Award. (Co-Investigator; **awarded**).
  19. *Collaborative Research for Quantum Optics Teaching Laboratory--Preparation for the Age of Quantum Information*, multi-university proposal with \$15,000 dedicated to Adelphi University, National Science Foundation.
  20. *Exploring the Quantum-Classical Boundary: Undergraduate Research in Classical and Quantum Teleportation*, \$29,776, Research Corporation Cottrell College Science Award.
  21. *Exploring the Quantum-Classical Boundary: Undergraduate Research in Classical and Quantum Teleportation*, \$4,500, Adelphi University, 2004 President's Faculty Development Award. (**awarded**)

### **External Member on PhD Committees:**

- Brian Arnold, *Velocity Dependence of the Adiabatic Rapid Passage Force in Metastable Helium*, Stony Brook University Department of Physics (2019)
- Daniel Stack, *Optical Forces from Periodic Adiabatic Rapid Passage Sequences on Metastable Helium Atoms*, Stony Brook University Department of Physics (2012)

### **Professional Development**

- Diversity Certificate 2.0, Adelphi University (August 2023)
- Quantum Faculty Online Learning Community (FOLC) (2021-22)\*
- QUEST: Quantum Undergraduate Education & Scientific Training (June 2021)
- Diversity Certificate, Adelphi University (May 2021)

\* Program highlighted in <https://www.aps.org/publications/apsnews/202301/innovation.cfm>, including excerpts from interview with me

### **Service & Professional Activities:**

#### **National/International:**

- IEEE-HKN (electrical engineering honor society)
  - Presidential Line (President-Elect 2024, President 2025, Past President 2026)
  - Editorial Board Member, IEEE-HKN *The Bridge* (7/2021-)
  - Board of Governors, Regions 1 & 2 Governor (01/2018-12/2019)
  - Faculty Advisor Committee, Chair (01/2018-12/2020)
- American Association of Physics Teachers
  - Lotze Scholarship Committee (2016)
  - Executive Planning Committee (2014-15)
- National Selection Committee (NSC) for the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST), administered by the National Science Foundation (2010, 2011, 2017, 2021; panel chair, 2017 & 2021)
- Association of College Honor Societies, Nominating Committee (2015)
- Society of Physics Students National Council, Zone 2 Councilor (2010-2014)
  - Committee Phi: Physics Career Opportunities (2013, Chair)
  - Committee A: Careers for Physics Baccalaureate Degree Holders (2012, Chair)
  - Committee C: Automating Sigma Pi Sigma (2011); Sigma Pi Sigma Issues (2010)
- Workshop Presenter at the 2012 Conference on Laboratory Instruction Beyond the First Year of College (conducted workshop over two days for physics faculty from across the nation; held at the University of Pennsylvania and Drexel University)
- Preliminary Reviewer for the *Next Generation Science Standards* (2012)
- Student & Pre-College Activities Chair, GLOBECOM 2005 (international conference of Communications Society of IEEE)
- Reviewer for the following academic journals (review ~6 papers/year total on average):
  - *Physical Review Letters* (a journal of the APS)
  - *Applied Physics Letters* (a journal of the AIP)
  - *Physical Review A* (a journal of the APS)
  - *Optics Express* (a journal of the OSA)
  - *Optics Letters* (a journal of the OSA)
  - *The Physics Teacher* (a journal of the AAPT)
  - *IEEE Transactions on Education*



**Regional/Site-specific:**

- Advisory Committee, University of Missouri-Rolla Electrical Engineering Reaccreditation (2007)
- Science Instructor for summer middle school outreach through Groundworks (a youth support organization in Brooklyn, NY—Summer 2006 and 2007)
- Junior Science & Humanities Symposium, LI Regional Reader & Judge (04, 05, 06, 07, 08)
- Rohm and Haas Electronic Materials Invitational Science Fair Judge (2006)
- Mentored three high school students in research projects (2: 05-06; 1: 21-22)

**University:**

- Faculty Committee on Retention, Tenure, and Promotion (FCRTP) (2017-2020)
- Laser Safety Officer (2017-2018)
- Pre-Medical Council (2006-14; 2016-)
- STEP Steering Committee (2009-14; 2016-)
- Adelphi Research Conference Organizing Committee (2004-2014); Co-Chair (2006-2011)
- Faculty Senate Academic Affairs Committee (Spring 2008-Fall 2009)
- Faculty Senate, Physics Departmental Rep. (Sp 2004; Sp 2009; Sp 2010; 2017)
- University Safety Committee (2016-2017); Laser Safety Sub-Committee (2017)
- Senate Mapping Learning Goals Task Force (2011-2013); Chair (8/12-12/13)
- Intellectual Property Committee (2006-14)
- Quantitative Reasoning General Education Assessment Committee (2006-14)
- Faculty Senate Admissions & Retention Committee Member (Spring 2004)

**College:**

- College of Arts & Sciences Academic Affairs Committee (2007-14; 16-17; 19-); Chair (1/10-8/13); Co-Chair (8/19-5/20)
- Chemistry Unit Peer Review Committee\* (2021-22)
- Search Committee for Associate Dean for Student Success and Strategic Initiatives (2020)
- College of Arts & Sciences Assessment Committee (2018-19)
- Math/CS Unit Peer Review Committee\* (2016)
- Environmental Studies Unit Peer Review Committee\* (2010-14)
- College of Arts & Sciences Strategic Planning Committee (2010-13)
- NSF TOP Mentor (2007-12)
- Bettelheim Award Review Committee (2010-14)

\* while department-level service, these are UPRCs in *other* departments/units in the college

**Department:**

- Faculty Advisor, Adelphi Physics Club (2003-2014); Co-Advisor (2016-)  
-*Outstanding Chapter* of the Society of Physics Students (06, 07, 08, 09, 10, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22)
- Physics Diversity, Equity, & Inclusion Task Force (2020-; Chair, 2023-)
- Physics Unit Peer Review Committee (2009-14; 2016-)
- Took lead on total curricular overhaul for BS & BA (under review with planned launch of Fall 2025)
- Academic advisor to large number of students (consistently advise between 1/3 and 1/2 of all physics majors, equal to ~25-40 advisees for most years (currently down to 12 due to reduce enrollment); with students on several academic tracks, including 3-2 engineering, STEP, and graduate prep, this is a time-consuming role)

- Organized outreach to secondary school science classes (2005-14)
- Authored primary proposal to reinstate M.S. program in physics
- Various recruitment & promotional activities—Update and development of departmental website; assistance in creation and regularly updating of departmental flyer and brochure; participation in university & departmental open houses and accepted student days (on average, participate in ~6 major recruitment events/year).

### **Professional Registration and Societies:**

- Institute of Electrical and Electronics Engineers (IEEE): Awarded *Senior Member* in 2020
  - Photonics Society
  - Education Society
- Eta Kappa Nu (IEEE-HKN)—Electrical Engineering Honor Society
- American Association of Physics Teachers (AAPT)
- American Physical Society (APS)
  - Division of Laser Science (DLS)
- Optical Society of America (OSA)
- American Association for the Advancement of Science (AAAS)
- Society of Physics Students (SPS)
- SPIE—The International Society for Optical Engineering
- Sigma Pi Sigma—Physics Honor Society
- Omicron Delta Kappa—Leadership Honor Society
- Tau Beta Pi—Engineering Honor Society
- Advanced Laboratory Physics Association (ALPhA)
- Registered Engineer-in-Training, Missouri, 1995

### **Student Research Advised:**

Carolina Guekjian (Fall 2023-)—First-year student in Physics

Mitchell Pozovskiy (Fall 2023-)—First-year student in Physics

John Lund (Fall 2023-)—First-year student in Physics

Zahin Ritee (Summer 2021- Spring 2023)—BS Physics

- Presented at PhysCon 2022 (Award Winning Poster)

Amanta Promi (Summer 2021-Spring 2022)—BS Physics

- Mary Klement Fellow, Summer 2021; Presented at 2022 March APS Meeting

Mateo Murillo (Summer 2019-Spring 2022)—BS Physics 2022

- McDonell Scholar, Summer 2021; Presented at 2022 March APS Meeting; Presented at 2021 APS/DLS Undergraduate Research Symposium; Presented at PhysCon 2019; Completed Divisional Honors Thesis

Shalauni Patel (Summer 2020-Spring 2022)—BS Physics

-McDonell Scholar, Summer 2020

Katie Gifford (Summer 2019)—BS Physics 2022

- Presented at PhysCon 2019

Zoya Shafique (Summer 2017-Spring 2020)—BS Physics 2020

-Completed Divisional Honors Thesis; Presented at APS/DLS 2018 Meeting and APS 2019 March Meeting; Outstanding Poster Award at 2019 Adelphi Research Conference

Thomas Danza (Summer 2018-Spring 2020)—Continuing student in 3-2 Program

-McDonell Scholar, Summer 2019; Presented at APS/DLS 2018 Meeting, APS 2019, and PhysCon 2019

Richard Mouradian (Summer 2018-Spring 2020)—Continuing student in 3-2 Program  
 -Presented at APS/DLS 2018 Meeting, APS 2019 March Meeting, and PhysCon 2019

Hamid Jalili (Summer 2017-Summer 2019)—BS Physics 2019  
 -McDonnell Scholar, Summer 2018; Presented at APS/DLS 2018 Meeting and APS 2019 March Meeting

Zeenat Baig (Spring 2018-Summer 2019)—BS Physics 2020  
 -Presented at APS/DLS 2018 Meeting and APS 2019 March Meeting; Outstanding Poster Award at 2019 Adelphi Research Conference

Allan Delarosa (Spring 2017-Spring 2018)—B.S. Physics 2019  
 -McDonnell Scholar, Summer 2017; Presented at APS/DLS 2017 Meeting, APS 2018 March Meeting, & 15<sup>th</sup> Annual Adelphi University Research Conference

Muhammad Aziz (Spring 2017-Spring 2018)—B.S. Physics 2019  
 - Presented at APS/DLS 2017 Meeting, APS 2018 March Meeting, & 15<sup>th</sup> Annual Adelphi University Research Conference

Chloe Ong (Summer 2017)—Senior in Physics

Amandeep Kaur (Spring 2017)—Senior in Biochemistry

Kasey Hernandez (Spring 2017)

Egla Ochoa-Madrid (Spring 2017)—B.S. Physics 2017  
 -Acoustics research

Xiang Hua (Summer 2016)—B.S. Physics (Stony Brook) 2016  
 -LTC student; broadband waveplate study

Grant Richmond (Summer 2016)—Senior in Physics (Stony Brook)  
 -LTC student; broadband waveplate study; Presented at APS/DLS 2016 Meeting

Jessica Kurlander (Summer 2016)—Junior in Physics (Stony Brook)  
 -LTC student; broadband waveplate study; Presented at APS/DLS 2016 Meeting

Angela Pizzuto (Summer 2016)—B.S. Physics (Stony Brook) 2016  
 -LTC student; cylindrical diffraction study; Presented at APS/DLS 2016 Meeting

Alex Gifford (Summer 2016)—Senior in Physics (Stony Brook)  
 -LTC student; cylindrical diffraction study; Presented at APS/DLS 2016 Meeting

Max Stanley (Summer 2016)—Junior in Physics (Stony Brook)  
 -LTC student; Gaussian mode study; Presented at APS/DLS 2016 Meeting

Jay Rutledge (Summer 2016)—Junior in Physics (Stony Brook)  
 -LTC student; Gaussian mode study; Presented at APS/DLS 2016 Meeting

Marcus Lo (Summer 2016)—Senior in Physics (Stony Brook)  
 -LTC student; Gaussian mode study; Presented at APS/DLS 2016 Meeting

Hannah Pell (Summer 2015)—B.S. Physics/B.A. Music (Lebanon Valley College) 2016  
 -SPS SOCK Intern; acoustics educational project  
 -Presented at AAPT Winter Meeting 2016

Shauna LeFebvre (Summer 2015)—B.S. Physics (Union College) 2016  
 -SPS SOCK Intern; acoustics educational project  
 -Presented at APS 2016 March Meeting

Sajan Shrestha (Summer 12-Summer 13)—B.S. Physics, 2013  
 -McDonnell Scholar, Summer 2012  
 -Presented at Optical Society of America 96th Annual Meeting, 2012.

Danielle Sofferman (Summer 11-Summer 13)—B.S. Physics, 2013  
 -McDonnell Scholar, Summer 2011  
 -Presented at Optical Society of America 96th Annual Meeting, 2012.

- Monika Mohacsi (Fall 12-Spring 13)—B.S. Physics, 2015  
 -Honor's Thesis Student  
 -Publication in preparation
- Chris Coen (Summer 12-Fall 13)—B.S. Physics, 2016  
 -Honor's Thesis Student
- Steve Jaycox (Fall 12-Fall 13)—B.S. Physics, 2016  
 - Honor's Thesis Student
- Justin Dove (Fall 08-Sum 12)—B.S. Physics & Math, 2012; Honor's research on quantum optics  
 - Presented at American Physical Society Annual Meeting, Feb. 2010, Washington, D.C.; 24<sup>th</sup> National Conference on Undergraduate Research, April 2010, Missoula, MT; awarded 1<sup>st</sup> Place Physical Science Talk at the 7<sup>th</sup> Annual Adelphi University Research Conference; presented at the Rochester Symposium for Undergraduate Physics Students, Society of Physics Students Zone 2 Meeting, West Point, NY, April 2009; awarded 1<sup>st</sup> Place Physical Science Talk at the 6<sup>th</sup> Annual Adelphi University Research Conference; awarded 2<sup>nd</sup> Place Poster (with Mijael Damian) at the 2011 Society of Physics Zone 2 Meeting, Ithaca, NY; presented at the 8<sup>th</sup> Annual Adelphi University Research Conference
- Alyssa Greico (Fall 11-Spring 12)—B.S. Physics, 2012  
 -Honor's Thesis Student
- Brian Capozzi (Spring 09-Spring 10)—B.S. Physics, 2010  
 - Completed his Honor's Thesis on "Fundamental Origins of Complementarity"
- Mijael Damian (Spring 11-Summer 11)—B.S. Physics, 2012  
 - Awarded 2<sup>nd</sup> Place Poster (with Justin Dove) at the 2011 Society of Physics Zone 2 Meeting, Ithaca, NY; presented at the 8<sup>th</sup> Annual Adelphi University Research Conference; McDonell Scholar, Summer 2011
- Anthony Kolodzinski (Fall 08-Spr 11)—B.S. Physics, 2012; Honor's research on nonlinear optics  
 -Presented at American Physical Society Annual Meeting, Feb. 2010, Washington, D.C.; 24<sup>th</sup> National Conference on Undergraduate Research, April 2010, Missoula, MT; 7<sup>th</sup> Annual Adelphi University Research Conference
- Peter Cruz (Fall 08-Spring 11)—B.S. Physics, 2012; research on quantum dots
- Kaitlin O'Neill (Spring 07-Spring 09)—B.S. Physics 2009  
 - Presented at the 1<sup>st</sup> Commission on Independent Colleges and Universities Undergraduate Research Exposition in Albany, NY; work accepted to the 22<sup>nd</sup> National Conference on Undergraduate Research in Salisbury, MD; awarded 1<sup>st</sup> Place Physical Science Poster at the 5<sup>th</sup> Annual Adelphi University Research Conference
- Nicholas Miceli (Fall 08-Spring 09)—Researched nonlinear optics
- Camilo Malagon (Fall 04-Summer 07)—B.S. Physics 2007  
 - Completed his Honor's Thesis on complementarity with quantum entangled photons  
 - Will be co-author on journal submission involving thesis project; awarded 1<sup>st</sup> Place Science Talk at the 4<sup>th</sup> Annual Adelphi University Research Conference
- Charles Anderson (Spring 05-Sum 06)—B.S. Physics & Philosophy 2006  
 - Awarded 1<sup>st</sup> place student presentation at the New York State Section of the American Physical Society Fall 2005 Symposium; co-author on paper published in Optical Engineering; co-author on presentation at QELS 2006; presented at the 2005 Annual Meeting of the Optical Society of America in Tucson, AZ; presented at the March Meeting of the American Physical Society in Baltimore, MD; presented at the 20<sup>th</sup> National Conference on Undergraduate Research in Asheville, NC; awarded 1<sup>st</sup> Place Science Talk at the 3<sup>rd</sup> Annual Adelphi University Research Conference

Deanna Nohs (Spring 04-Spring 05)—B.S. Physics 2005; researched quantum entanglement  
 - Presented at the 19<sup>th</sup> National Conference on Undergraduate Research in Lexington, VA  
 -Awarded 1<sup>st</sup> Place Science Poster at the 2<sup>nd</sup> Annual Adelphi University Research Conference  
 Marie Chesaniuk (Fall 05-Spr 06)—B.A. English 2006; researched nonlinearities of quantum dots  
 Gaurav Kaushik (Spring 05-Spring 07)—Honor’s Thesis research on quantum entanglement  
 Hoda Rifai (Spring 07)—Researched nonlinear optics  
 - Presented at the 4<sup>th</sup> Annual Adelphi University Research Conference  
 George Harrison (Spring 07)— Researched nonlinear optics  
 - Presented at the 4<sup>th</sup> Annual Adelphi University Research Conference  
 Yusuf Yusufov (Summer-Fall 07)—Researched quantum entanglement  
 Earland Pete (Spring 07)— Researched nonlinear optics  
 - Presented at the 4<sup>th</sup> Annual Adelphi University Research Conference  
 Haralampos (Bob) Psaradellis (Summer 05)—B.S. Physics 2005; researched low noise optical detectors  
 Alex Manov (Fall 03-Spring 05)—B.S. Physics & Math 2005; researched quantum entanglement  
 - Presented at the 1<sup>st</sup> Annual Adelphi University Research Conference  
 Faith Barclay (Spring 04-Summer 04)—B.S. Physics 2004; researched quantum entanglement  
 Dulce Andrade (Spring 04)—B.S. Physics 2004; researched quantum entanglement  
 Charles DiGennaro (Fall 03-Summer 04)—B.S. Physics 2005; researched quantum entanglement  
 Bryan Mytko (Spring 05)—B.S. Physics 2005; researched quantum dots  
 Vismay Shah (Fall 05-Spring 06)—Researched quantum dots

**Courses Taught at Adelphi (all 3-credits except as noted; lecture & lab courses=3+3 credits):**

Summer 2024:

0156-390: Special Topic: Quantum Engineering (Pre-College Program, 5 students)

Spring 2024:

0156-112: College Physics II (lab; 12 students)

0156-243: Intro. to Electrical Engineering (lecture & lab; 12 students)

0156-490: Ind. Study—Developing an Analog Computer for Simulations (1 student)

0156-490: Ind. Study—Intro to Quantum Electrodynamics (1 student)

Fall 2023:

0156-113: Physics for Science Majors I (lecture: 39 students; lab: 11 students)

0156-123: Basic Science Behind the Headlines (45 students)

Spring 2023:

0156-114: Physics for Science Majors II (lab: 13 students)

0156-123: Basic Science Behind the Headlines (44 students)

0156-428: Quantum Mechanics (4-credit; 9 students)

Fall 2022:

0156-243: Intro. to Electrical Engineering (lecture & lab; 5 students)

0156-264: Optics (7 students)

0156-490: Ind. Study—Nonlinear Optics (1 student)

Summer 2022:

0156-112: College Physics II (lecture & lab; 19 students)

0156-114: Physics for Science Majors II (lecture & lab; 25 students)

0156-243: Intro. to Electrical Engineering (lecture & lab; 1 student)

Spring 2022:

0156-112: College Physics II (lab; 14 students)

0156-114: Physics for Science Majors II (lecture: 20 students; lab: 8 students)

Spring 2022 (continued):

- 0156-112/114 Lab Coordinator (3 credits to create new labs and coordinate all lab sections)
- 0156-123: Basic Science Behind the Headlines (46 students)
- 0156-421: Undergraduate Physics Project I—Super-resolution Optics (1 student)
- 0156-490: Ind. Study—Optics (2 students)
- 0156-490: Ind. Study—Digital Circuits (2 students)

Fall 2021:

- 0156-243: Intro. to Electrical Engineering (lecture & lab; 13 students)
- 0156-428: Quantum Mechanics (4-credit; 15 students)
- 0156-490: Ind. Study—Signals & Systems (1 student)

Summer 2021:

- 0156-112: College Physics II (lecture & lab; 20 students)
- 0156-114: Physics for Science Majors II (lecture & lab; 9 students)

Spring 2021:

- 0156-112: College Physics II (two sections totaling 57 students)
- 0156-114: Physics for Science Majors II (25 students)
- 0156-123: Basic Science Behind the Headlines (25 students)
- 0156-264: Optics (12 students)

Fall 2020:

- 0156-211: Mathematical Methods in Physics I (4-credit; 18 students)
- 0156-243: Intro. to Electrical Engineering (lecture & lab; 15 students)
- 0156-428: Quantum Mechanics (4-credit; 8 students)

Summer 2020:

- 0156-112: College Physics II (lecture & lab; 29 students)
- 0156-114: Physics for Science Majors II (lecture & lab; 8 students)

Spring 2020:

- 0156-114: Physics for Science Majors II (two sections totaling 40 students)
- 0156-123: Basic Science Behind the Headlines (47 students)
- 0156-422: Undergraduate Physics Project II—Quantum Magnetic Sensor (1 student)
- 0156-490: Ind. Study—Quantum Imaging (3 students)
- 0156-490: Ind. Study—Analog Circuits (2 student)
- 0156-490: Ind. Study—Digital Circuits (1 student)

Fall 2019: [3 credits release for FC RTP]

- 0156-211: Mathematical Methods in Physics I (4-credit; 12 students)
- 0156-428: Quantum Mechanics (4-credit; 13 students)
- 0156-490: Ind. Study—Quantum Entanglement Research (1 student)

Summer 2019:

- 0156-111: College Physics I (lecture & lab; 18 students)
- 0156-113: Physics for Science Majors I (lecture & lab; 7 students)

Spring 2019:

- 0156-114: Physics for Science Majors II (two sections totaling 36 students)
- 0156-243: Intro. to Electrical Engineering (22 students)
- 0156-490: Ind. Study—Lasers (2 students)

Fall 2018: [3 credits release for FC RTP]

- 0156-123: Basic Science Behind the Headlines (48 students)
- 0156-211: Mathematical Methods in Physics I (4-credit; 16 students)
- 0156-421: Undergraduate Physics Project I—Quantum Eraser (2 students)
- 0156-490: Ind. Study—Quantum Entanglement (2 students)

Summer 2018:

- 0156-112: College Physics II (lecture & lab; 11 students)
- 0156-114: Physics for Science Majors II (lecture & lab; 5 students)
- 0156-123: Basic Science Behind the Headlines (5 students)

Spring 2018:

- 0156-114: Physics for Science Majors II (two sections totaling 59 students)
- 0156-123: Basic Science Behind the Headlines (46 students)
- 0156-456: Quantum Mechanics II (7 students)

Fall 2017:

- 0156-123: Basic Science Behind the Headlines (45 students)
- 0156-243: Intro. to Electrical Engineering (10 students)
- 0156-428: Quantum Mechanics (4-credit; 18 students)

Summer 2017:

- 0156-112: College Physics II (lecture & lab; 8 students)
- 0156-114: Physics for Science Majors II (lecture & lab; 4 students)

Spring 2017:

- 0156-114: Physics for Science Majors II (two sections totaling 63 students)
- 0156-123: Basic Science Behind the Headlines (46 students)
- 0156-490: Ind. Study—Semiconductor Physics (4 students)

Fall 2016:

- 0156-113: Physics for Science Majors I (42 students)
- 0156-123: Basic Science Behind the Headlines (43 students)
- 0156-243: Analog Circuits (15 students)
- 0156-428: Quantum Mechanics (4-credit; 11 students)
- 0156-490: Ind. Study—Thought Experiments (1 student)

Summer 2016:

- 0156-112: College Physics II (lecture & lab; 4 students)
- 0156-114: Physics for Science Majors II (lecture & lab; 5 students)

Spring 2016:

- 0156-114: Physics for Science Majors II (31 students)
- 0156-244: Digital Circuits (lecture & lab; 6 students)

Fall 2013:

- 0156-113: Physics for Science Majors I (29 students)
- 0156-123: Basic Science Behind the Headlines (57 students)
- 0156-211: Mathematical Methods in Physics I (4-credit; 17 students)
- 0156-243: Analog Circuits (lecture & lab; 13 students)

Summer 2013:

- 0156-111: College Physics I (lecture & lab; 12 students)
- 0156-113: Physics for Science Majors I (lecture & lab; 10 students)

Spring 2013:

- 0156-114: Physics for Science Majors II (31 students)
- 0156-123: Basic Science Behind the Headlines (46 students)
- 0156-244: Digital Circuits (lecture & lab; 11 students; one registered as 490)
- 0156-301: Mathematical Methods in Physics II (8 students)

Fall 2012:

- 0156-113: Physics for Science Majors I (41 students)
- 0156-211: Mathematical Methods in Physics I (4-credit; 12 students)
- 0156-243: Analog Circuits (lecture & lab; 14 students)

- 0156-490: Ind. Study—MATLAB Applied Programming (4 students)
- Summer 2012:
- 0156-111: College Physics I (lecture & lab; 13 students)
- 0156-113: Physics for Science Majors I (lecture & lab; 2 students)
- Spring 2012:
- 0156-123: Basic Science Behind the Headlines (18 students)
- 0156-244: Digital Circuits (lecture & lab; 10 students)
- 0156-301: Mathematical Methods in Physics II (4-credit; 21 students)
- 0156-390: Special Topic—Quantum Mechanics II (5 students)
- 0156-490: Ind. Study—Particle Physics & QFT (1 student)
- 0156-490: Ind. Study—Applied Nonlinear Optics (1 student)
- Fall 2011:
- 0156-211: Mathematical Methods in Physics I (4-credit; 21 students)
- 0156-243: Analog Circuits (lecture & 2 sections of lab; 13 students)
- 0156-490: Ind. Study—Solid State for Chemists (1 students)
- 0156-490: Ind. Study—Applications of Quantum (1 students)
- 0156-490: Ind. Study—Quantum Information (1 students)
- Summer 2011:
- 0156-111: College Physics I (lecture & lab; 10 students)
- 0156-113: Physics for Science Majors I (lecture & lab; 1 students)
- 0156-490: Ind. Study—Physics Internship (1 student)
- 0801-550: Special Topic—Science and Math Applied Real-problem Teaching (7 students)
- Prior to Summer 2011:
- 0156-111: College Physics I (lecture x 7; lab x 8)
- 0156-112: College Physics II (lecture x 3; lab x 5)
- 0156-113: Physics for Science Majors I (lecture x 4; lab x 6)
- 0156-114: Physics for Science Majors II (lecture x 3; lab x 4)
- 0156-123: Basic Science Behind the Headlines (x 2)
- 0156-211: Mathematical Methods in Physics I (x 8; 4-credit)
- 0156-216: Modern Physics (x 1)
- 0156-243: Analog Circuits (lecture & lab; x 6 each)
- 0156-244: Digital Circuits (lecture & lab; x 7 each)
- 0156-301: Mathematical Methods in Physics II (x 7)
- 0156-302: Theoretical Physics (x 1)
- 0156-322: Advanced Physics (lecture x 1; lab x 2)
- 0156-390: Special Topic—Quantum Mechanics II (x 1)
- 0156-428: Quantum Mechanics (x 3; 4-credit)
- 0156-490: Ind. Study (topics: Quantum Mechanics; Experimental Quantum Optics; Quantum Mechanics II; Analog Circuits; Intro. to Nonlinear Optics; Intro. to Quantum Entanglement; Partial Differential Equations; Experimental Nonlinear Quantum Dots; Solid State Physics; Optics; Experimental Quantum Physics; Intro. to Quantum Physics; Engineering Mathematics; Intro. to Thermodynamics, Electronics, and Optics Lab; Intro. to Quantum Optics; Experimental Optical Physics; Modern Optical Physics)
- 0801-550: Special Topic—Science and Math Applied Real-problem Teaching (x 1)



### **Courses & Curriculum Created/Developed at Adelphi:**

- I took a lead role in a complete overhaul of the physics programs (BS, BA, and minor; currently in review process) to give the students more hands-on learning, more programming and computation, more common goals throughout the curriculum, and a more focused approach on career training and preparation.
- For Physics for Science Majors I & II, the critical introductory sequence for our majors, I increased rigor and totally revised the recitation format to create student-facilitated learning groups [2017]. I also completely revised the laboratory for Physics II, making it more exploratory and based in actual scientific methods and related writing [2022].
- Physics 123—Basic Science Behind the Headlines: I created this course (which has reached 595 students as of fall 2023, with 45 more students signed up for fall 2024, and was the basis of a talk to physics educators at a national conference in 2013) to increase scientific awareness and critical thinking by non-science majors on societal issues such as energy sources, climate, medical technologies, security, and more.
- Physics 211—Mathematical Methods in Physics I: I redesigned this course to be more focused on material needed by our students continuing to applied fields such as engineering, and also introduced more numerical methods and computer-based problem solving. Feedback from students that went on to engineering programs frequently pointed to this course as one of their most valuable.
- Physics 243—Introduction to Electrical Engineering: I completely revised the content of this course. It had previously been titled Analog Circuits and only covered op-amp circuits. To better meet the needs of our students continuing on to engineering programs, I now have the course cover dc and ac circuit analysis, as well as an introduction to analog and digital circuits. I also created new labs to accompany the revised material, and added the use of LTSpice, an industry-level circuit simulation tool.
- Physics 244—Digital Circuits: I updated this course to introduce the use of VHDL programming for use with FPGA-based boards (previously the course had no use of programmable logic devices).
- Physics 456—Quantum Mechanics II: I created this course to better prepare our students continuing on to graduate study.
- Physics 421& 422—Undergraduate Physics Project I & II: I resurrected these courses to formalize a divisional honors program within physics, culminating in a thesis to be defended in front of a faculty committee.
- Education 550—S/T: Science and Math Applied Real-problem Teaching: Course created as part of my NSF-funded program with area high schools. The course trained current Adelphi science and mathematics education students, as well as providing continuing education to current science and mathematics teachers.

### **Previous Experience:**

- Graduate Research Assistant, August 1999-August 2003, University of Rochester, Rochester, NY
- Graduate Teaching Assistant, August 1998-May 1999, University of Rochester
- Graduate Teaching Assistant, August 1995-July 1997, University of Missouri-Rolla, Rolla, MO; taught EE 282—Circuits and Machines and seven sections of EE 220—Electronic Circuits Lab
- Graduate Research Assistant, Summer 1995 and Spring 1996, University of Missouri-Rolla
- Engineering Intern, Summer 1993, Chillicothe Municipal Utilities, Chillicothe, MO