

## Degrees

1989-1997: Doctoral degree in Physics, University of Connecticut.

1988-1989: Master's degree in Physics, University of Connecticut.

1983-1987: Bachelor of Arts in Physics and Economics, University of California at Berkeley.

## Teaching Experience

August 2015-present: Professor and Chair of Physics at Davidson College. I have taught the algebra-based (Physics 120) and calculus-based (Physics 130 and 230) introductory physics courses, the intermediate-level courses in mathematical methods (Physics 201), classical (Physics 330), electromagnetism (PHY 350), and quantum (PHY 360) mechanics. I am currently the Advisor for the Davidson College Chapter of the Society of Physics Students (SPS). I have also led the laboratory manager, instrumentation specialist, physics visiting, and computational and experimental physics searches, am a member of the Physics QEP team, am a Core Faculty Member of the HHMI Steering Committee, have served on the Educational Policy, TRP, and Alenda Lux Committees, and am the Posse 4 faculty advisor.

August 2012-July 2015: Professor of Physics at Davidson College. I have taught the non-science major course in astronomy with lab (Physics 106), algebra-based (Physics 220) and calculus-based (Physics 230) introductory physics courses, the intermediate-level courses in mathematical methods (Physics 201), classical mechanics (Physics 330), and quantum mechanics (Physics 360). I have served on the Advisory Group for Classrooms (2012-2013), the Student Study and Research Committee (2013-2014), and the Academic Advising Committee (2014). I served as the Advisor for the Davidson College Chapter of the Society of Physics Students (SPS).

August 2005-July 2012: Associate Professor of Physics at Davidson College. I have taught the non-science major course in astronomy (Physics 105), algebra-based (Physics 120 and 220) introductory physics courses and laboratories, computational physics (Physics 200), the intermediate-level courses in mathematical methods (Physics 201), classical mechanics (Physics 330), quantum mechanics (Physics 360), and theoretical astrophysics (Physics 410). I have served on the Review Board (2009-2012), the Academic Computing Committee (2006-2009), the College's SACS Reaffirmation of Accreditation "Depth" Committee (2005-2007), the College's Strategic Assessment Teaching and Learning Study Group (2008-2010), and served on the Advisory Group for the search for a new Director of Grants and Contracts (2005) and for the new Director and Outreach Coordinator positions for the Mathematics and Science Center (2008-2009). Advisor for the Davidson College Chapter of the Society of Physics Students (SPS).

August 1999-July 2005: Assistant Professor of Physics at Davidson College. I have taught the algebra-based (Physics 120) and calculus-based (Physics 130) introductory physics courses and laboratories, the intermediate-level courses in mathematical methods (Physics 201), classical mechanics (Physics 330), electromagnetic theory (Physics 350), theoretical astrophysics (Physics 410), and quantum mechanics (Physics 360), and the advanced course in quantum mechanics (Physics 460). I have also taught independent study (Physics 396) and independent research (Physics 496) courses in my theoretical research area. My teaching philosophy is based on the fact that research into the teaching and learning of physics

shows that students learn best when they actively participate in the learning process. In order to actively engage students, I have been teaching with the Socratic Method and the physics-education-research-based teaching innovation Just-in-Time Teaching (JiTT) in all my courses. My Physics 120 course and my teaching methods were profiled in the Syllabus column of the February 16, 2001 issue of the Chronicle of Higher Education. I have twice rewritten all of the laboratory experiments and the laboratory manual for the Physics 120/130 courses. The most recent rewrite coincided with a major purchase of new laboratory computers, interfaces, and digital and analog sensors. I have also taught class meetings of modern physics (Physics 320) in 1998, 2000, 2001, 2002, and 2003, and German 100W (2004) and Religion 410 (2001 and 2004), speaking about topics in my research specialty of theoretical particle physics and quantum mechanics. I am also the Webmaster for departmental Web pages (1999-present), have been the departmental seminar organizer (1999-2001), served on several faculty search committees (2000, 2000, 2003, 2004), and served on the College's Campus and Religious Life (2000-2003), Executive (2003-2005), and Biohazards (2004-2005) committees.

1998-1999: Visiting Assistant Professor of Physics at Davidson College. In the fall, I taught the algebra-based introductory physics course and four introductory (calculus-based and algebra-based) laboratories. In the spring, I taught the algebra-based introductory physics course and labs and taught the junior-level course in electromagnetism. I organized the purchase of new digital and analog sensors for the introductory physics labs. I also served on a faculty search committee.

1997-1998: Visiting Assistant Professor of Physics at Eckerd College. I taught both semesters of the introductory physics with calculus course (lecture and laboratory) to science majors. I extensively used computers in the lab and lecture. I wrote a new lab utilizing computer simulations of electric and magnetic field lines. I taught both semesters of the junior-/senior-level course in quantum mechanics. I also designed and taught a new course for non-science majors, "The Evolving World-View of Science," which stressed scientific methodology and recent developments in modern physics. I was a member of the undergraduate thesis committee of two senior physics majors and I supervised an independent study, "Supersymmetric Quantum Mechanics," during the Winter Term.

1997 and 1996: Instructor, Kids Are Scientists, Too (KAST) Program at the University of Connecticut. I taught physics and astronomy to 4-6th and 7-9th graders. I redesigned and built an experiment, led the Web-based astronomy module, used computers to teach data analysis, and was involved in curriculum development.

1996, 1988-1991: Graduate Teaching Assistant at the University of Connecticut. I taught the laboratory sections of the introductory physics course for engineers and physics majors.

## **Research Experience**

August 1999-present: Starting at Davidson College, I have established a theoretical research program involving undergraduates. This research program is in theoretical and computational quantum mechanics as these topics are readily accessible to undergraduates. I have successfully engaged 25 students in my quantum-mechanics research program. I have received a Research Corporation grant to support this research, originally focusing on supersymmetric quantum mechanics (SUSY QM). In addition, I have engaged students in one-, two-, and three-dimensional quantum-mechanics research focusing on the time development of wave packets. We have three state-of-the-art computer workstations to support this research. In addition to working with undergraduates at Davidson, I have been working with Richard Robinett and Michael Doncheski of Pennsylvania State University studying fundamental quantum-mechanical systems.

August 1999-present: Working with Wolfgang Christian, we have established an extremely successful program in physics education research and development using the Java applets called Physlets and the Java

packages, applications, and programs from the Open Source Physics (OSP) project. We are an award-winning, nationally and internationally recognized authority in the authoring, design, and effective use of interactive curricular materials. We have authored over 1000 Physlet-based exercises from introductory physics to advanced quantum mechanics. Much of the material we have written appears on the peer-reviewed MERLOT Web site, on the iLumina and ComPADRE NSF digital libraries, and on the Companion Web sites to several Prentice Hall texts. I have co-authored eight books: *Multi-Representational Mechanics* and *Multi-Representational Electromagnetics* (in Hebrew), *Physik mit Physlets*, *Fizika s Fizleti: Interaktivne predstavivte in raziskave za uvod v fiziko*, *Physlet<sup>®</sup> Quantum Physics: An Interactive Introduction*, *Fislets: Enseñanza de la Física con Material Interactivo*, *Physlet<sup>®</sup> Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics* and *Physlets: Teaching with Interactive Curricular Material*. Wolfgang and I have also received a 2002 MERLOT Award for Exemplary Online Learning Resources and also the paper, “Physlets for Quantum Mechanics,” *Comp. Sci. Eng.* **5**, 90-96 (2003), was deemed “Best Education Article” in *Computing in Science and Engineering*. This work has been supported by Associated College of the South (ACS) Teaching with Technology Fellowships and also by the National Science Foundation.

1990-1997: Research Assistant with Professor Kurt Haller at the University of Connecticut. We constructed coherent states and operator-valued gauge-invariant fields that implement Gauss's law in QCD. The purpose of this work is to represent QCD in terms of gauge-invariant quark and gluon fields, which may lead to an understanding of confinement.

1989-1990: Research Assistant with Professor Fred Lipshultz and Professor John Tanaka at the University of Connecticut. We studied a technique developed to measure charges in insulators and suggested how this technique can be used in undergraduate experiments.

### **Grants Received (external)**

July 2005: \$450,000, National Science Foundation's CCLI-EMD program (DUE-0442581) for the proposal, “OPTIC: **O**pen **P**hysics **T**echnology for **I**nteractive **C**urricula.” I am co-PI on this grant with Wolfgang Christian as PI.

May 2005: \$2,500, Associated Colleges of the South, Teaching with Technology Fellowship with Wolfgang Christian. Summer fellowship for the project, “Open Source Physics Curricular Material and Programs for Teaching Spin in Quantum Mechanics.”

May 2003: \$2,500, Associated Colleges of the South, Teaching with Technology Fellowship with Wolfgang Christian. Summer fellowship for the project, “Developing Open Source Physics Curricular Material and Programs for Quantum Mechanics.”

July 2002: \$494,715, National Science Foundation's CCLI-EMD program (DUE-0126439) for the proposal, “**O**pen-**S**ource **P**hysics **E**ducatio**N** (**O**PEN).” I am co-PI on this grant with Wolfgang Christian as PI.

May 2002: \$2,500, Associated Colleges of the South, Teaching with Technology Fellowship with Larry Cain and Wolfgang Christian. Summer fellowship for the project, “Using Physlets and Just-in-Time Teaching in Quantum Mechanics, II.”

November 2001: \$26,682, Research Corporation Cottrell College Science Award (CC5470) for the proposal, “Using Supersymmetric Quantum Mechanics to Construct and Investigate New Exactly Solvable *PT*-Symmetric Periodic Potentials.”

May 2001: \$2,500, Associated Colleges of the South, Teaching with Technology Fellowship with Larry Cain and Wolfgang Christian. Summer fellowship for the project, “Using Physlets and Just-in-Time Teaching in Quantum Mechanics.”

### **Grants Received (internal)**

May 2018: \$4,000, Davidson College FS&R Grant.

May 2017: \$4,000, Davidson College FS&R Grant.

April 2016: \$15,000, Clark Ross Davidson Research Initiative (DRI) Group Investigation Grant. Funded 15 students and 3 faculty to attend PhysCon16, the 2016 Sigma Pi Sigma Quadrennial Congress in San Francisco, CA.

May 2015: \$3,500, Davidson College Clark Ross FS&R Grant.

May 2014: \$3,500, Davidson College FS&R Grant.

April 2013: \$14,000, Davidson College Bacca Innovation Grant. Grant with Wolfgang Christian to explore and develop new technologies for teaching astronomy and physics.

April 2012: \$2,000, Davidson College Teaching Improvement Grant to develop the new astronomy with laboratory course (first taught fall 2012).

May 2010: \$3,500, Davidson College FS&R Grant.

May 2009: \$3,500, Davidson College FS&R Grant.

May 2005: \$3,200, Davidson College FS&R Grant.

May 2004: \$3,200, Davidson College FS&R Grant.

September 2002: \$450, Davidson College’s Dean Rusk Program. Partial funding for my trip to Paris, France to participate in the CoLoS meeting and to Parma, Italy to participate in the 7th Workshop on Multimedia in Physics Teaching and Learning.

May 2002: \$3,000, Davidson College FS&R Grant. Summer support for physics majors Kevin Bell and Andrew Schoewe for work on supersymmetric quantum mechanics.

May 2002: \$2,500, Associated Colleges of the South, Teaching with Technology Fellowship with Larry Cain and Wolfgang Christian. Summer fellowship for the project, “Using Physlets and Just-in-Time Teaching in Quantum Mechanics, II.”

May 2001: \$3,000, Davidson College FS&R Grant. Summer support for mathematics major Ben Sargent for work on supersymmetric quantum mechanics.

May 2000: \$2,500, Davidson College FS&R Grant. Summer support for Junior physics major Tim Valdes for work on supersymmetric quantum mechanics.

### **Awards/Honors**

January 2018: 2016-2017 Society of Physics Students Distinguished Chapter Award.

January 2017: 2015-2016 Society of Physics Students Outstanding Chapter Award.

February 2016: 2014-2015 Society of Physics Students Outstanding Chapter Award.

November 2015: Finalist for the Society of Physics Students Outstanding Chapter Advisor Award.

January 2015: 2013-2014 Society of Physics Students Outstanding Chapter Award.

November 2014: 2012-2013 Society of Physics Students Outstanding Chapter Award.

December 2013: 2011-2012 Society of Physics Students Outstanding Chapter Award.

December 2012: 2010-2011 Society of Physics Students Outstanding Chapter Award.

November 2012: George B. Pegram Award for “Excellence in the Teaching of Physics in the Southeast” from the Southeastern Section of the American Physical Society.

October 2009: John L. Hubisz Award for Outstanding Service to the Section from the North Carolina Section of the American Association of Physics Teachers.

July 2009: Excellence in Undergraduate Physics Teaching Award from the American Association of Physics Teachers.

November 2007: Undergraduate Computational Engineering and Sciences (UCES) Award from the Krell Institute. Award given to the Open Source Physics Project (Wolfgang Christian, Mario Belloni, Anne Cox, Harvey Gould, Jan Tobochnik, and Douglas Brown) for promotion and enhancement of computational engineering and science. The award honors innovation, educational impact, and breadth of development and implementation of educational materials.

March 2007: Best Pedagogical Paper Award from the North Carolina Section of the American Association of Physics Teachers.

July 2006: As part of its 75th anniversary celebration, the American Institute of Physics posted the top five articles from *Computing in Science and Engineering*. The paper, “Physlets for Quantum Mechanics,” M. Belloni and W. Christian, *Comp. Sci. Eng.* **5**, 90-96 (2003), was deemed “Best Education Article” and stated that “this article meets the ideal framed by the mission of *CiSE* as a publication.” Available at: [http://www.aip.org/anniversary/pubs\\_cise.html](http://www.aip.org/anniversary/pubs_cise.html).

January 2006: Distinguished Service Award from the American Association of Physics Teachers.

October 2004: Web page on QCD (quantum chromodynamics) referenced in the American Institute of Physics News Brief 703 (<http://www.aip.org/pnu/2004/703.html>) which described the 2004 Nobel Prize in Physics. My Web page was one of three listed as a reference on QCD. Web page: <http://webphysics.davidson.edu/mjb/qcd.html>.

February 2002 and October 2003: The Multimedia Educational Resource for Learning and Online Teaching (MERLOT) Physics Editorial Panel posted peer reviews of educational content Wolfgang Christian and I authored from the *Physlet* and *Physlet Physics* books, respectively. Only the best MERLOT material is chosen for review. The honor acknowledged our contribution to teaching and learning, and to the scholarship of teaching in physics.

September 2002: 2002 Multimedia Educational Resource for Learning and Online Teaching (MERLOT) Award for Exemplary Online Learning Resources. Wolfgang Christian and I received the award for our

work on Physlets. The competition featured entries from each of MERLOT's twelve discipline communities (so-called *MERLOT Classics*). Our work received the highest honor of *Editor's Choice* for being an exemplary model for all disciplines.

September 2002: 2002 Multimedia Educational Resource for Learning and Online Teaching (MERLOT) Award for Exemplary Online Learning Resources. Wolfgang Christian and I received the award for our work on Physlets. Our work was recognized by the physics discipline committee as a *MERLOT Classic*.

February 2001: My Physics 120 course and my teaching methods (Physlets and Just-in-Time Teaching) were profiled in the Syllabus column of the February 16, 2001 issue of the Chronicle of Higher Education.

1990: Marshall Walker Outstanding Teaching Assistant Award.

1989: Dielectrics and Electrical Insulation Society (DEIS) Fellowship.

1989: Marshall Walker Outstanding Teaching Assistant Award.

1988: Charles A. Reynolds Predoctoral Fellowship.

### **Student Awards/Honors/Theses**

April 2018: Davidson Research Initiative Grant to Esteban Leon ('19).

January 2018: Society of Physics Students Distinguished Chapter Award (2016-2017 academic year).

May 2017: 59-page Honors Thesis, "Recursion Relations for Gluon Scattering Amplitudes in AdS<sub>4</sub>/CFT<sub>3</sub>," completed by Nikolaos Dokmetzoglou ('17).

May 2017: 74-page Honors Thesis, "A Spectral Study of the Quantum-mechanical Asymmetric Infinite Square Well," completed by Vincent E. Hickl ('17).

April 2017: Davidson Research Initiative Grant to Nancy Pruetz ('18).

January 2017: Society of Physics Students Outstanding Chapter Award (2015-2016 academic year).

February 2016: Society of Physics Students Outstanding Chapter Award (2014-2015 academic year).

April 2015: Davidson Research Initiative Grant to Vincent Hickl ('17).

December 2014: Society of Physics Students Outstanding Chapter Award (2013-2014 academic year).

December 2013: Society of Physics Students Outstanding Chapter Award (2012-2013 academic year).

February 2013: Society of Physics Students Outstanding Chapter Award (2011-2012 academic year).

February 2012: Society of Physics Students Outstanding Chapter Award (2010-2011 academic year).

February 2011: Davidson Research Initiative Grant to Leah Ruckle ('12).

September 2006: Best Undergraduate Student Paper Award from the North Carolina Section of the American Association of Physics Teachers. Award given to David Sheibley ('07).

May 2006: 76-page Honors Thesis, "An Analytic Study of the Quantum-mechanical Asymmetric Infinite Square Well," completed by Laura Gilbert ('06).

April 2006: Physics Award at Davidson College. Award given to Laura Gilbert ('06).

March 2006: Best Undergraduate Student Paper Award from the North Carolina Section of the American Association of Physics Teachers. Award given to Laura Gilbert ('06).

October 2005: Outstanding Undergraduate Student Award from the North Carolina Section of the American Association of Physics Teachers. Award given to Laura Gilbert ('06).

April 2005: Sigma Xi Undergraduate Research Award. Award given to Laura Gilbert ('06) for research completed with Mario Belloni.

April 2003: Sigma Xi Undergraduate Research Award. Award given to Adam Abele ('03) for research completed with Wolfgang Christian and Mario Belloni.

### **Professional Service/Outreach/Leadership**

October 2015: Organizing Committee of the Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

January 2015-present: Associate Editor of the *American Journal of Physics* for Resource Letters.

January 2015-present: Member American Association of Physics Teachers Publications Committee.

November 2013-present: Referee for *Physics Letters A*.

July 2013-December 2014: Chair of 2014 AAPT National Nominating Committee.

January 2013-December 2013: Elected member of 2013 AAPT National Nominating Committee.

June 2012: Organizer and Discussion Leader for the session, "What is Happening at Small Institutions," Gordon Research Conference on Physics Research and Education: Astronomy, Waterville, Maine.

January 2012-January 2015: Member of *The Physics Teacher* Editorial Board.

June 2011-November 2015: Member of the *Physics Today* Advisory Board.

March 2011-August 2011: Organizing Committee of the Using Astronomy to Teach Physics Workshop, Lincoln, Nebraska.

March 2011-present: Referee for *Physics Today*.

October 2010: Organizing Committee of the Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

August 2010-July 2011: Interim Zone Councilor for SPS Zone 5 (North Carolina and South Carolina).

July 2010: Panel Member, NSF DUE.

June 2010-present: Referee for *Journal of Physics A: Mathematical and Theoretical*.

May 2010-present: Referee for *Canadian Journal of Physics*.

April 2010-present: SPS Outreach. In collaboration with the Davidson Chapter of SPS, I have led and/or organized numerous astronomy outreach events (Community School of Davidson, EAC's Do it in the Dark, and Cub Scout Pack 58, Den 4).

February 2010: Pines Lecture, “The First Three Minutes.”

February 2010-present: Member of the Committee on Physics in Undergraduate Education of the American Association of Physics Teachers.

August 2009-present: Member of the *Computing in Science and Engineering* Editorial Board.

February 2009-present: Referee for *Physics Review (Special Topics: Physics Education Research)*.

February 2009-February 2010: Chair of the Committee on Educational Technologies of the American Association of Physics Teachers.

October 2008-December 2008: Member of the American Physical Society Forum on Education Nominating Committee.

April 2008: Organizing Committee of the Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

January 2008-February 2009: Vice Chair of the Committee on Educational Technologies of the American Association of Physics Teachers.

September 2007-December 2007: Member of the *Computing in Science and Engineering* Editor in Chief Selection Committee.

July 2007: Session Organizer and Chair, “Need for Speed,” Summer Meeting of the American Association of Physics Teachers, Greensboro, NC.

May 2007: Leader and Participant for the Section Representative/Area Chair Governance Retreat for the American Association of Physics Teachers.

May 2007-present: North Carolina Section Representative of the American Association of Physics Teachers. Elected by the North Carolina Section.

April 2007-May 2007: Planning Committee for the Section Representative/Area Chair Governance Retreat for the American Association of Physics Teachers.

January 2007-January 2008: Member of the Meetings Committee of the American Association of Physics Teachers.

January 2007-January 2010: Member of the Committee on Educational Technologies of the American Association of Physics Teachers.

March 2005-present: Referee for *Physica Scripta*.

September 2006: Session Chair, Third International Conference on Hands-on Science, HSCI' 2006, Braga, Portugal.

July 2006: Session Chair, American Association of Physics Teachers, Syracuse, New York.

May 2006-August 2009: Books Department Editor, *Computing in Science and Engineering*.



March 2006: Session Chair, North Carolina Section of the American Association of Physics Teachers, Belmont, North Carolina.

March 2006: Panel Member, NSF CCLI Phase II Review.

December 2005-present: Physics Content Reviewer for MERLOT.

October 2005: Session Chair, North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

September 2005-May 2006: Member, SPS Committee on Undergraduate Research.

September 2005: Attended the 2005 SPS and Sigma Pi Sigma National Council Meeting as proxy Zone Councilor from Zone 5, Washington, D.C.

July 2005: Evaluator for the U. S. Physics Talent Search in conjunction with the World Year of Physics.

June 2005: Radio talk show guest for the program, "Einstein's Miraculous Year," with Wolfgang Christian and Chuck Stone on Charlotte Talks with Mike Collins, WFAE 90.7 fm. 9am broadcast and 7pm rebroadcast (6/24/05).

March 2005-present: Referee for *Foundations of Physics Letters*.

October 2004: Co-chair, Local Organizing Committee, Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and the Zone 9 Society of Physics Students, Davidson, North Carolina.

May 2004: Invited Expert at the "Lunch with the Experts" with the topic: *Using the Results of Physics Education and Other Research in the Liberal Arts Classroom* at the April Meeting of the American Physical Society, Denver, Colorado.

January 2004-January 2007: Membership and Benefits Committee of the American Association of Physics Teachers. Nominated by Section Representatives and approved by the AAPT Council (the body of Section Representatives and Board Members).

January 2004-January 2005: Chair and Member of the Committee on Educational Technologies of the American Association of Physics Teachers.

November 2003: Referee for the *Physics Education Research Conference Proceedings* (Madison WI, 2003).

June 2003-present: Member of the ComPADRE Quantum Physics Editorial Board. ComPADRE (Communities of Physics and Astronomy Digital Resources for Education) is a network of collections that provide learning resources and interactive learning environments. This effort is supported by the NSF NSDL Initiative and AAS, SPS, AIP/APS, Physics Central, and AAPT.

April 2003-present: North Carolina Section Representative of the American Association of Physics Teachers. Elected by the North Carolina Section.

April 2003-present: Referee for *The Physics Teacher*.

January 2003-January 2004: Chair and Member of the Committee on Educational Technologies of the American Association of Physics Teachers.

September 2002: Session chair at the 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Parma, Italy.

August 2002-present: Referee for the *American Journal of Physics*.

June 2002: Discussion Leader for the session, "Theoretical Research and Teaching Quantum Mechanics," Gordon Research Conference on Physics Research and Education: Quantum Mechanics, South Hadley, MA.

March 2000: Session Chair, North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

August 1999-present: Co-organizer and co-leader of numerous (see **Workshops** below) curriculum development workshops for high school and college physics teachers.

## Books

December 2014: *Física em Physlets: Ilustrações, Explorações e Problemas para um Ensino Interativo em Física Introdutória* [Portuguese Edition Kindle Edition], P. Simeão Carvalho, E. Pereira Briosa, W. Christian, M. Belloni, M. F. Costa. The Portuguese ebook is available at all Amazon stores in Kindle format. The book contains the pedagogical explorations of the animations; the Physlet simulations are available free at the website: <http://www.fc.up.pt/physletspt/ebook>.

July 2014: *Physlet<sup>®</sup> Quantum Physics: 2E*, Mario Belloni, Wolfgang Christian, and Anne J. Cox. All-electronic second edition of the *Physlet Quantum Physics* book, including ebook. All 200+ interactive Physlet-based exercises were updated and rewritten, and the narrative was substantially updated and revised for the new edition, housed at the ComPADRE national science digital library at: <http://www.compadre.org/pqp>. The electronic book (ISBN: 978-0-9905805-1-2-2) is available for free on iTunes.

July 2014: *Physlet<sup>®</sup> Physics: 2E*, Wolfgang Christian and Mario Belloni. All-electronic second edition of the *Physlet Physics* book, including ebook. All 800 interactive Physlet-based exercises were updated and rewritten for the new edition which is housed at the ComPADRE national science digital library at: <http://www.compadre.org/physlets>. The electronic books, Volume I (ISBN: 978-0-9905805-0-8) and Volume II (ISBN: 978-0-9905805-1-5) are available for free on iTunes and Google Play.

October 2008: גרסה עברית דר' דוד פונדק, דר' סעיד פעילויות דינאמיות בהדגמה, הקירה, ופתרון בעיות בקורסי פיזיקה *Multi-Representational Electromagnetics: Physlet<sup>®</sup> Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics*, Wolfgang Christian, Mario Belloni, Arie Maharshak, and David Pundak. A 205-page book and CD with over 100 interactive Physlet-based exercises for Hebrew-speaking physics students and teachers. 03-9522326. <http://braude.ort.org.il/physlet/>.

December 2006: גרסה עברית דר' דוד פונדק, דר' סעיד פעילויות דינאמיות בהדגמה, הקירה, ופתרון בעיות בקורסי פיזיקה *Multi-Representational Mechanics: Physlet<sup>®</sup> Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics*, Wolfgang Christian, Mario Belloni, and David Pundak. A 194-page book and CD with over 100 interactive Physlet-based exercises for Hebrew-speaking physics students and teachers. 03-9518418. <http://braude.ort.org.il/physlet/>.

November 2006: *Physik mit Physlets*, Frank Scheickert, Peter Kraemer, Alfred Nussbaumer, W. Christian, and M. Belloni. An 88-page book and CD with over 100 interactive Physlet-based exercises for German-speaking physics students and teachers. Published by Klett, ISBN: 3-12-772620-1.

July 2006: *Fizika s Fizleti: Interaktivne predstavitve in raziskave za uvod v fiziko*, Wolfgang Christian, Mario Belloni, and Saša Divjak. A 266-page book and CD with over 300 interactive Physlet-based exercises for Slovenian-speaking introductory physics students and teachers. Published by the Slovenian Ministry of Education and Sports (Ministrvo za šolstvo in šport, Zavod Republike Slovenije za šolstvo), ISBN: 9612345597. July 2006.

August 2005: *Physlet<sup>®</sup> Quantum Physics: An Interactive Introduction*, Mario Belloni, Wolfgang Christian, and Anne J. Cox. A 224-page interactive textbook and CD with over 200 Physlet-based exercises for the teaching of quantum physics. *Physlet Quantum Physics* is designed as a compliment to any modern physics and quantum mechanics textbook. Part of Prentice Hall's Series in Educational Innovation. ISBN 0-13-101970-8.

March 2004: *Fislets: Enseñanza de la Física con Material Interactivo*, por Francisco Esquembre, Ernesto Martín, Wolfgang Christian y Mario Belloni. A 456-page book and CD with over 300 interactive Physlet-based exercises for Spanish-speaking introductory physics students and teachers. Prentice-Hall, España, ISBN: 84-205-3781-0.

July 2003: *Physlet<sup>®</sup> Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics*, Wolfgang Christian and Mario Belloni. A 327-page interactive textbook and CD with over 800 Physlet-based exercises for the teaching of introductory physics. Part of Prentice Hall's Series in Educational Innovation. ISBN 0-13-101969-4.

October 2000: *Physlets: Teaching Physics with Interactive Curricular Material*, Wolfgang Christian and Mario Belloni. A 277-page book and CD on teaching pedagogy for Web-based curricular material based on interactive Physlet problems. Part of Prentice Hall's Series in Educational Innovation. ISBN 0-13-029341-5.

### **Instructor's Manuals**

March 2006: *Instructor's Manual for Physlet<sup>®</sup> Quantum Physics*, Mario Belloni and Anne J. Cox. A 72-page instructor manual to accompany *Physlet<sup>®</sup> Quantum Physics*. Prentice-Hall 2006.

### **Books as Contributing Author**

January 2006: Integration of *Physlet<sup>®</sup> Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics* by Wolfgang Christian and Mario Belloni into *College Physics* by Jerry Wilson, Anthony Buffa, and Bo Lou, Sixth Edition. Entire *Physlet Physics CD* appears in the back of the book and "PHYSLET" bookmarks appear in the margins to point the reader to the appropriate Physlet-based materials on the CD. Prentice-Hall 2006.

### **Book Chapters**

February 2012: Mario Belloni and Wolfgang Christian, "The Physlet Project," in the book, *Quick Hits: Teaching with Technology*, Faculty Colloquium on Excellence in Teaching (FACET), Indiana University Press. ISBN: 978-0-253-00612-7.

February 2012: Wolfgang Christian and Mario Belloni, "The Open Source Physics Project on ComPADRE," in the book, *Quick Hits: Teaching with Technology*, Faculty Colloquium on Excellence in Teaching (FACET), Indiana University Press. ISBN: 978-0-253-00612-7.

January 2006: “Authoring Curricular Material,” by Mario Belloni and Wolfgang Christian, Chapter 15 of *Open Source Physics: A User’s Guide with Examples* by Wolfgang Christian. Also wrote the curriculum in “osp\_demo.jar” which is on the CD, which accompanies the text. Addison-Wesley 2006.

### **Journal Publications (undergraduates denoted by a \*)**

January 2018: “Parallel programming with Easy Java Simulations,” Francisco Esquembre, Wolfgang Christian, and Mario Belloni, *Am. J. Phys.* **86**, 54 (2018); <https://doi.org/10.1119/1.5012510>.

October 2017: “Exact results for the infinite supersymmetric extensions of the infinite square well,” K. Gutierrez\*, E. Leon\*, M. Belloni, and R. W. Robinett, *submitted to the American Journal of Physics*.

October 2015: “The Physlet Approach to Simulation Design,” Wolfgang Christian, Mario Belloni, Francisco Esquembre, Bruce A. Mason, Lyle Barbato and Matt Riggsbee, *The Physics Teacher* **53**, 419 (2015).

July 2014: “The infinite well and Dirac delta function potentials as pedagogical, mathematical and physical models in quantum mechanics,” Mario Belloni and Richard W. Robinett, *Physics Reports*, Vol. **540** (2) pp. 25-122 (10 July 2014). <http://dx.doi.org/10.1016/j.physrep.2014.02.005>.

April 2014: “Physlets e Open Source Physics para professores e estudantes Portugueses,” Paulo Simeão Carvalho, Wolfgang Christian, and Mario Belloni, *Revista Lusófona de Educação* **25**, 145-158 (2014).

April 2013: “Graphs and Tracks Revisited,” Wolfgang Christian and Mario Belloni, *The Physics Teacher* **51**, 240 (2013).

March 2013: “Teaching Astronomy Using Tracker,” Mario Belloni, Wolfgang Christian, and Douglas Brown, *The Physics Teacher* **51**, 149-151 (2013).

December 2012: “Transit of Venus with an iPhone,” Emmy Belloni, Nancy Bondurant, and Mario Belloni, Cover Image, *The Physics Teacher* **50** (2012).

December 2012: “Astrophotography on the Cheap,” Chuck Niederriter and Mario Belloni, *The Physics Teacher* **50**, 520-523 (2012).

November 2012: “The biharmonic oscillator and asymmetric linear potentials: From classical trajectories to momentum-space probability densities in the extreme quantum limit,” L. J. Ruckle\*, M. Belloni, and R. W. Robinett, *European Journal of Physics* **33** 1505 (2012).

October 2012: “Tumbling: From Rally Cars to Toast,” Mario Belloni and Wolfgang Christian, *The Physics Teacher*, **50**, 427 (2012).

May 2011: “Teaching Physics (and Some Computation) Using Intentionally Incorrect Simulations,” Anne J. Cox, William F. Junkin III, Wolfgang Christian, Mario Belloni, and Francisco Esquembre, *The Physics Teacher*, **49**, 273-276 (May 2011).

January 2011: “Less than perfect quantum wavefunctions in momentum-space: How  $\Phi(p)$  senses disturbances in the force,” Mario Belloni and Richard W. Robinett, *Am. J. Phys.*, **79** (1) pp. 94-102 (2011).

June 2010: “New Mathematical Identities from Quantum Mechanical Sum Rules: Parity-related Potentials,” Seyi Ayorinde\*, Kelsey Chisholm\*, Mario Belloni, and Richard W. Robinett, *J. Phys. A: Mathematical and Theoretical*, **43** 235202, 22 pp. (2010).

January 2009: “Constraints on Airy function zeros from quantum-mechanical sum rules,” Mario Belloni and Richard W. Robinett, *J. Phys. A: Mathematical and Theoretical*, **42** 075203, 11pp. (2009).

November 2008: “A Simple Demonstration for the Static Ladder Problem,” Mario Belloni, *The Physics Teacher* **46**, 503-504 (2008).

September 2008: “Quantum mechanical sum rules for two model systems,” Mario Belloni and Richard W. Robinett, *Am. J. Phys.* **76**, 798-806 (2008).

April/May 2008: “Time Development in Quantum Mechanics Using a Reduced Hilbert Space Approach.” Mario Belloni and Wolfgang Christian. *Am. J. Phys.* **76**, 385-392 (2008).

October 2007: “Teaching Qualitative Energy-eigenfunction Shape with Physlets,” Mario Belloni, Wolfgang Christian, and Anne J. Cox,” *The Physics Teacher* **45**, 488-491 (2007).

September 2007: “Strategies for Adopting Interactive Engagement Methods,” Mario Belloni and Anne J. Cox,” For the New Teacher Column, *The Physics Teacher* **45**, 395-397 (2007).

July 2007: “Improving Students’ Understanding of Quantum Mechanics,” Chandralekha Singh, Mario Belloni, and Wolfgang Christian, *Parity (the Japanese language version of Physics Today)*, July 20-29 (2007).

July 2007: “Open Source Physics Curricular Material for Quantum Mechanics: Dynamics and Measurement of Quantum Two-state Superpositions,” Mario Belloni, Wolfgang Christian, and Douglas Brown, *Computing in Science and Engineering* **9**, 24-31 (2007).

March 2007: “Approaches for Improving Students’ Understanding of Quantum Mechanics,” Chandralekha Singh, Mario Belloni, and Wolfgang Christian, *Letters Column, Physics Today*, pp. 8-14, March (2007). Letters and responses from the paper: “Improving Students’ Understanding of Quantum Mechanics,” Chandralekha Singh, Mario Belloni, and Wolfgang Christian, *Physics Today*, pp. 43-49, August (2006).

November 2006: “Playing Quantum Physics Jeopardy with zero-energy eigenstates,” Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, *American Journal of Physics* **74**, 1035-1036 (2006). ArXiv number: quant-ph/0606196.

November 2006: “Piecewise Zero-curvature Energy Eigenfunctions in One Dimension,” Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, *European Journal of Physics* **27**, 1331-1339 (2006).

September 2006: “An Open Source XML Framework for Authoring Curricular Material,” Wolfgang Christian, Mario Belloni, and Douglas Brown, *Computing in Science and Engineering*, September/October (2006).

August 2006: “Improving Students’ Understanding of Quantum Mechanics,” Chandralekha Singh, Mario Belloni, and Wolfgang Christian, *Physics Today*, pp. 43-49, August (2006).

December 2005: “Teaching Physics with Physlet-based Ranking Task Exercises,” Anne J. Cox, Mario Belloni, and Wolfgang Christian, *The Physics Teacher* **43**, 587-592 (2005).

September 2005: “More on the Asymmetric Infinite Square Well: Energy Eigenstates with Zero-curvature,” Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, *European Journal of Physics* **26**, 815-825 (2005). ArXiv number: quant-ph/0512156.

July 2005: “Physlets and Open Source Physics for Quantum Mechanics: Visualizing Quantum-mechanical Revivals,” Mario Belloni and Wolfgang Christian, *MERLOT Journal of Online Learning and Teaching (JOLT)* Volume 1, No. 1, July 2005. *Invited*. Web address: <http://jolt.merlot.org/>.

June 2005: “Zero-curvature Solutions to the One-dimensional Schrödinger Equation,” Mario Belloni, Michael Doncheski, and Richard Robinett, *Physica Scripta* **72**, 2-3, 122-126 (2005). ArXiv number: quant-ph/0410104.

February 2005: “Exact Results for ‘Bouncing’ Gaussian Wave Packets,” Mario Belloni, Michael Doncheski, and Richard Robinett, *Physica Scripta* **71**, 2, 136-140 (2005). ArXiv number: quant-ph/0408182.

September 2004: “Wigner Quasi-probability Distribution for the Infinite Square Well: Energy Eigenstates and Time-dependent Wave Packets,” Mario Belloni, Michael Doncheski, and Richard Robinett, *The American Journal of Physics* **74**, 9, 1183-1192 (2004). ArXiv number: quant-ph/0312086.

May 2004: “Using Physlets and Open Source Physics to Make Quantum Mechanics Visual and Interactive,” Mario Belloni, Wolfgang Christian, and Larry Cain, (invited) *Transformations: Liberal Arts in the Digital Age* Volume 2, No. 1 (2004). *Transformations* is the Associated Colleges of the South’s electronic journal. Paper is available at: <http://www.colleges.org/transformations/index.php?q=node/view/77>.

May 2004: “Teaching Special Relativity with Physlets®,” Mario Belloni, Wolfgang Christian, and Melissa H. Dancy, *The Physics Teacher* **42**, 284-290 (2004).

November 2003: “Интерактивные учебные материалы на основе физлетов,” Вольфганг Кристиан, Марио Беллони, Мелисса Дэнси и Анна Кох, *Russian Journal: Computer Tools in Education* **5'2003**, p. 30-41, St. Petersburg (2003).

September 2003: “Teaching Thermodynamics with Physlets® in Introductory Physics,” Anne J. Cox, Mario Belloni, Wolfgang Christian, and Melissa H. Dancy, *Physics Education* **38**, 433 (2003). This paper was downloaded from the journal Web site 100 times in the first 13 days of it being posted.

January 2003: “Physlets for Quantum Mechanics,” Mario Belloni and Wolfgang Christian, *Computing in Science and Engineering* **5**, 90 (2003). The Web site with the curricular material referred to in this paper was visited over 1,000 times in 2003.

November 2002: “Teaching with Physlets®: Examples from Optics,” Melissa Dancy, Wolfgang Christian, and Mario Belloni, Featured Article, *The Physics Teacher* **40**, 494 (2002).

November 2001: “Physlets: Web-based Java Applets for Physics Education,” Wolfgang Christian, Mario Belloni, and Melissa Dancy, Fall Newsletter of the American Physical Society Forum on Education. Available at: <http://www.aps.org/units/fed/fall2001/index.html>.

1997: “Gauss’s law, gauge-invariance and long-range forces in QCD,” Mario Belloni, Lusheng Chen, and Kurt Haller, *Phys. Lett.* **B403**, 316 (1997).

1997: “Gauss’s law and gauge-invariant operators and states in QCD,” Lusheng Chen, Mario Belloni, and Kurt Haller, *Phys. Rev. D* **55**, 2347 (1997).

1996: “Implementing Gauss’s law in Yang-Mills theory and QCD,” Mario Belloni, Lusheng Chen, and Kurt Haller, *Phys. Lett.* **B373**, 185 (1996).

1992: “A Laboratory For Student Research On Insulators Using The Pulsed Electroacoustic Technique,” M. Belloni, F. Lipschultz, and J. Tanaka, Annual Report of CEIDP p. 334. 92CH3123-7. ISBN 0-7803-0565-5.

## Proceedings Publications

January 2009: “Open Source and Open Access Resources for Quantum Physics Education,” Mario Belloni, Wolfgang Christian, and Bruce Mason, *Journal of Chemical Education Online*." Paper available at: <http://www.jce.divched.org/Journal/Issues/2009/Jan/abs125.html>. January 2009.

January 2005: “Multimedia Curricular Material Informed by Physics Education Research: Physlet-based Ranking Task Exercises,” Anne J. Cox, Mario Belloni, and Wolfgang Christian, *Proceedings of the 9th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society*. Available at: <http://physik.uni-graz.at/MPTL9/index.php?style=3&item=5&subitem=3>.

October 2003: “Developing Open Source Programs for Upper Level Science and Mathematics,” Wolfgang Christian and Mario Belloni, *Proceedings of the 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society*.

September 2003: “Developing an Open Source Library and Programs for Science and Mathematics,” Wolfgang Christian and Mario Belloni, *Proceedings of the 2003 EUROCON Conference*, Ljubljana Slovenia, pp. 15-19, ISBN 0-7803-7763-X.

September 2003: “Authoring and Assessing Physlet<sup>®</sup>-based Interactive Curricular Material,” Wolfgang Christian, Mario Belloni, Melissa H. Dancy, and Anne J. Cox, *Proceedings of the 2003 EUROCON Conference*, Ljubljana Slovenia, pp. 41-44, ISBN 0-7803-7763-X.

July 2003: “Enseñando Física con los Fislets,” Ernesto Martín, Francisco Esquembre, Wolfgang Christian, y Mario Belloni, *Proceedings of the VIII Conferencia Interamericana sobre Educación en la Física*, Havana, Cuba.

June 2003: “Physlet-based Interactive Curricular Material,” Wolfgang Christian, Mario Belloni, Melissa H. Dancy, and Anne J. Cox, *Proceedings of the 2003 Computer Modeling Conference*, St. Petersburg, Russia, pp. 18-31.

June 2003: “Developing an Open Source Code Library for Science and Mathematics Teachers and Curriculum Authors,” Wolfgang Christian and Mario Belloni, *Proceedings of the 2003 Computer Modeling Conference*, St. Petersburg, Russia, pp. 6-18.

November 2002: “Enhancing Student Learning with Physlet-based Just-in-Time Teaching,” Mario Belloni, Wolfgang Christian and Aaron Titus, *Proceedings of the 2002 Invitational Conference on K-12 Outreach from University Science Departments: Using Technology to Link the Classroom to the Laboratory (and Murphy to Manteo)*, 52-57, The Science House, North Carolina State University, ISBN 0-9704885-5-6. Available at: <http://www.science-house.org/conf/conf02/proceedings.pdf>.

November 2002: “Using Physlets to Teach Quantum Mechanics,” Mario Belloni and Wolfgang Christian, *Proceedings of the 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society*. Available at: <http://informando.infm.it/MPTL/proceedings/MarioBelloni.PDF>.

November 2002: “A Brief Report on Available Multimedia Materials in the USA,” Mario Belloni, *Proceedings of the 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society*. Available at: <http://informando.infm.it/MPTL/proceedings/MarioBelloniReport.pdf>.

May 2001: “Physlets: Java Tools for a Web-based Physics Curriculum,” Wolfgang Christian, Mario Belloni, and Melissa Dancy, in the Proceeding of the 2001 International Conference on Computational Science: *Lecture Notes in Computer Science 2073, Computational Science – ICCS 2001*, 1061-1073, Springer-Verlag, ISBN 3-540-42232-3.

1993: “Constrained States in QCD: An Operator Approach to Gauss’s Law Constraint,” Mario Belloni and Kurt Haller, Proceedings of the Third International Workshop on Light-Cone Quantization, INFN, Gran Sasso, Assergi (Italy).

## **Curricular Packages**

June 2010: ComPADRE OSP Astronomy Collection. Uploaded, cataloged, and organized a collection of over 50 astronomy simulations, including writing four (Local Coordinates Model, Equatorial Coordinates Model, Sidereal and Solar Day, and Solar and Lunar Eclipse Model).

September 2007: “ajp\_reduced\_hilber.jar,” Mario Belloni and Wolfgang Christian. Self-contained file in support of the paper, “Time Development in Quantum Mechanics Using a Reduced Hilbert Space Approach.” File contains executable Java programs and curricular material.

May 2006: “osp\_measurement.jar,” Mario Belloni and Wolfgang Christian. We developed curricular material to support the teaching of quantum-mechanical measurement. Materials can be found on our quantum mechanics Web site, and also on the ComPADRE quantum mechanics digital library.

April 2006: “osp\_superposition.jar,” Mario Belloni and Wolfgang Christian. We developed curricular material to support the teaching of quantum-mechanical superpositions. Materials can be found on our quantum mechanics Web site, and also on the ComPADRE quantum mechanics digital library.

March 2006: “osp\_spins.jar,” Mario Belloni and Wolfgang Christian. We developed curricular material to support the teaching of quantum-mechanical spin. We also created a 55-page printable version of the materials available in PDF format. Materials can be found on our quantum mechanics Web site and also on the ComPADRE quantum mechanics digital library.

January 2006: “osp\_demo.jar,” Mario Belloni and Wolfgang Christian. We developed curricular material to support the teaching of classical orbits, electromagnetic radiation from point particles, and quantum-mechanical superpositions. Distributed on the CD which accompanies the text, *Open Source Physics*.

July 2005: “osp\_quilt.jar,” Chandralekha Singh, Mario Belloni and Wolfgang Christian. We developed an interactive tutorial to support the teaching of quantum-mechanical time evolution. Materials can be found on our quantum mechanics Web site, and also on the ComPADRE quantum mechanics digital library.

## **Web Publications**

January 2009: “Open Source and Open Access Resources for Quantum Physics Education,” Mario Belloni, Wolfgang Christian, and Bruce Mason, *Journal of Chemical Education Online*. Paper available at: <http://www.jce.divched.org/Journal/Issues/2009/Jan/abs125.html>.

April - June 2008: “Open Source and Open Access Resources for Quantum Physics Education,” Mario Belloni, Wolfgang Christian, and Bruce Mason, Invited Paper, An On-line CONFICHEM Conference: "Chemistry at the National Science Digital Library" <http://www.ched-ccce.org/confchem/2008/b/index.htm>. Paper available at: <http://www.ched-ccce.org/confchem/2008/b/P6/P6.htm>.

March 2007: Teaching with Physlets and Interactive Curricular Materials, M. Belloni, *Physics Workshop Project’s Electronic Newsletter*.



February 2007: “Physlets and Open Source Physics for Quantum Mechanics,” M. Belloni and W. Christian, *The Quantum Times*, Newsletter of the APS Topical Group on Quantum Information, Concepts, and Computation, Volume 1, Number 4.

November 2006: “Playing Quantum Physics Jeopardy with zero-energy eigenstates,” Laura Gilbert, Mario Belloni, Michael Doncheski, and Richard Robinett. Content to support the paper of the same name published in *The American Journal of Physics*. Available at: <http://webphysics.davidson.edu/mjb/jeopardy>. This material is also published as EPAPS Document E-AJPIAS-74-016609 at: [ftp://ftp.aip.org/epaps/am\\_j\\_phys/E-AJPIAS-74-016609/](ftp://ftp.aip.org/epaps/am_j_phys/E-AJPIAS-74-016609/).

September 2004: “Wigner Quasi-probability Distribution for the Infinite Square Well: Energy Eigenstates and Time-dependent Wave Packets,” Mario Belloni, Michael Doncheski, and Richard Robinett. Content to support the paper of the same name published in *The American Journal of Physics*. Available at: <http://webphysics.davidson.edu/mjb/wigner>. This material is also published as EPAPS Document E-AJPIAS-72-020408 at: [ftp://ftp.aip.org/epaps/am\\_j\\_phys/E-AJPIAS-72-020408/index.html](ftp://ftp.aip.org/epaps/am_j_phys/E-AJPIAS-72-020408/index.html).

August 2004: “Wigner Quasi-probability Distribution for the Infinite Square Well: Energy Eigenstates and Time-dependent Wave Packets,” Mario Belloni, Michael Doncheski, and Richard Robinett, *Virtual Journal of Nanoscale Science & Technology*, Volume 10, Issue 9 (2004). *American Journal of Physics* paper selected to appear in this weekly multi-journal compilation of the latest research on nanoscale systems. Available at: <http://scitation.aip.org/dbt/dbt.jsp?KEY=VIRT01&Volume=10&Issue=9>.

May 2004: Web site: “Using Physlets and Open Source Physics to Make Quantum Mechanics Visual and Interactive,” Mario Belloni, Wolfgang Christian, and Larry Cain. Content to support the paper of the same name in *Transformations: Liberal Arts in the Digital Age*. Available at: [http://webphysics.davidson.edu/mjb/acs\\_transformations\\_qm](http://webphysics.davidson.edu/mjb/acs_transformations_qm).

January 2003: “Physlets for Quantum Mechanics,” Mario Belloni and Wolfgang Christian. Content to support the paper of the same name that appeared in *CiSE*. These pages were visited over 1,000 times in 2003. Available at: [http://webphysics.davidson.edu/cise\\_qm](http://webphysics.davidson.edu/cise_qm).

August 2002: “Interactive Quantum Mechanics Exercises for Just-in-Time Teaching,” Mario Belloni, Larry Cain and Wolfgang Christian. This material was also posted on the MERLOT Web site. Supported by a 2002 ACS Teaching with Technology Fellowship. Available at: <http://webphysics.davidson.edu/qmbook>.

August 2001: “Interactive Quantum Mechanics Exercises,” Mario Belloni and Wolfgang Christian. Available at: [http://webphysics.davidson.edu/physlet\\_resources/](http://webphysics.davidson.edu/physlet_resources/).

August 2001: “Using Physlets and Just-in-Time Teaching in Quantum Mechanics,” with Larry Cain and Wolfgang Christian. This material is made out-of-date by: “Interactive Quantum Mechanics Exercises for Just-in-Time Teaching.” Supported by a 2001 ACS Teaching with Technology Fellowship.

October 2000: Web version of the curricular and reference material that accompanies the book *Physlets: Teaching with Interactive Curricular Material*, by W. Christian and M. Belloni, Prentice Hall, 2000. Available at: <http://webphysics.davidson.edu/physletprob>.

July 2000: Interactive physics problems (Physlets) that accompany the text: *Physics for Scientists and Engineers* by Douglas Giancoli. Work with Wolfgang Christian. Over 450 problems from kinematics to modern physics were written for this project. These problems appear on the Prentice Hall Companion Web Site for the text. Available at: <http://cwx.prenhall.com/bookbind/pubbooks/giancoli3/>. These problems also appear on the Companion Web Site to *Physics: An Introduction* by James S. Walker (<http://cwx.prenhall.com/bookbind/pubbooks/walker2/>), *Physics: An Introduction 2<sup>nd</sup> Edition* by James S.

Walker (<http://physics.prenhall.com/walker/>), and *College Physics* by Jerry Wilson and Anthony Buffa ([http://wps.prenhall.com/demo\\_2\\_of\\_esm\\_wilson\\_physics\\_5](http://wps.prenhall.com/demo_2_of_esm_wilson_physics_5)).

### **Book Manuscripts Reviewed**

March 2001 and May 2003: Franklin, *Classical Electromagnetism*, published in 2005.

October 2000: G. Pollack and D. Stump, *Electromagnetism*, published in 2002.

1999: P. Lorrain, D. Corson and F. Lorrain, *Electromagnetic Phenomena*, published in 2000.

1999: G. Novak, E. Patterson, A. Gavrin, and W. Christian, *Just-in-Time Teaching: Bending Active Learning with Web Technology*, published in 1999.

### **Research with Undergraduates**

Summer 2018: Summer Research with Esteban Leon. Supported by Davidson College DRI Grant.

Summer 2018: Summer Research with Jamie Barnhill. Supported by Davidson College FS&R Grant.

Summer 2018: Summer Research with Kevin Gutierrez. Jenks Physics Summer Research Fund.

Spring 2018: Research with Jamie Barnhill.

Spring 2018: Research with Kevin Gutierrez.

Summer 2017: Summer Research with Nancy Pruett. Supported by Davidson College DRI Grant.

Summer 2017: Summer Research with Esteban Leon. Supported by Davidson College FS&R Grant.

Summer 2017: Summer Research with Kevin Gutierrez. Supported by Davidson College RISE Grant.

Spring 2017: Research with Vincent Hickl.

Summer 2016: Summer Research with Julian Bertini. Supported by Davidson College RISE Grant.

Spring 2016: Research with Nikos Dokmetzoglou.

Spring 2016: Research with Alex Tyner.

Fall 2015: Research with Guy Scott.

Summer 2015: Summer Research with Nikos Dokmetzoglou. Supported by Davidson College FS&R Grant.

Summer 2015: Summer Research with Vincent Hickl. Supported by a Davidson College DRI Grant.

Spring 2015: Research with Colin Malone.

Spring 2015: Research with Vincent Hickl.

Fall 2014: Research with Marcus Begley.

Summer 2014: Summer Research with Jacob Simmonds. Supported by a Davidson College FS&R Grant.

Spring 2014: Research with Steven Keller.

Summer 2011: Summer Research with Leah Ruckle. Supported by a Davidson College DRI Grant.

Summer 2010: Summer Research with Leah Ruckle. Supported by a Davidson College FR&R Grant.

Summer 2009: Summer Research with Seyi Ayorinde and Kelsey Chisholm. Supported by a Davidson College Faculty Study and Research Grant.

Fall 2006: Research with Robert Correll.

Fall 2006: Research with David Sheibley.

Summer 2006: Summer Research with Robert Correll. Supported by a Davidson College FS&R Grant.

Summer 2006: Summer Research with David Sheibley. Supported by a Davidson College FS&R Grant.

Spring 2006: Research with Laura Gilbert.

Fall 2005: Research with Laura Gilbert.

Summer 2005: Summer Research with Laura Gilbert. Supported by a Davidson College FS&R Grant.

Summer 2004: Summer Research with Laura Gilbert. Supported by a Davidson College FR&R Grant and a Research Corporation Cottrell College Science Award.

Summer 2004: Summer Research with Kevin Bell. Supported by a Davidson College FS&R Grant.

Summer 2003: Summer Research with Kevin Bell. Supported by a Research Corporation Cottrell College Science Award.

Spring 2003: PHY 496-MB; Independent Research with Adam Abele.

Summer 2002: Summer Research with Kevin Bell. Supported by a Davidson College Faculty Study and Research Grant and a Research Corporation Cottrell College Science Award.

Summer 2002: Summer Research with Andrew Schoewe. Supported by a Davidson College Faculty Study and Research Grant and a Research Corporation Cottrell College Science Award.

Summer 2001: Summer Research with Ben Sargent. Supported by a Davidson College FS&R Grant.

Summer 2000: Summer Research with Tim Valdes. Supported by a Davidson College FS&R Grant.

Spring 2000: PHY 396-MB; Independent Study with Tim Valdes.

1998: Winter Term Independent Study with Matthew Fagen, Eckerd College.

### **Talks and Presentations given at Davidson College with Undergraduates (\*)**

May 2016: Alex Tyner\* and Mario Belloni, “The Quantum Bounce,” *Contributed Talk*, Davidson College Physics Department Seminar.

May 2016: Nikos Dokmetzoglou\* and Mario Belloni, “Momentum Space in 2- and 3-dimensions,” *Contributed Talk*, Davidson College Physics Department Seminar.

December 2015: Guy Scott\* and Mario Belloni “The Physics of Archery,” *Contributed Talk*, Davidson College Physics Department Seminar.

May 2015: Vincent Hickl\* and Mario Belloni, “The Asymmetric Infinite Square Well,” *Contributed Talk*, Davidson College Physics Department Seminar.

May 2015: Colin Malone\* and Mario Belloni, “The Quantum Bounce,” *Contributed Talk*, Davidson College Physics Department Seminar.

September 2010: Leah Ruckle\*, Mario Belloni, and Richard Robinett “The Biharmonic Oscillator and Asymmetric Linear Potentials in the Extreme Quantum Limit,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

September 2009: Seyi Ayorinde\*, Kelsey Chisholm\*, Wolfgang Christian, Richard Robinett, and Mario Belloni, “Negativity of the Wigner Function and its Applications,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

September 2009: Kelsey Chisholm\*, Seyi Ayorinde\*, Richard Robinett, and Mario Belloni, “New Mathematical Identities from Quantum Mechanical Sum Rules: Parity-related Potentials,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

August 2006: David Sheibley\* and Mario Belloni, “Studying a Quantum ‘Bounce’,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

August 2006: Robert Correll\*, Mario Belloni, and Wolfgang Christian, “Packets in the Classical Asymmetric Infinite Square Well,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

April 2006: Laura Gilbert\*, “An Analytic Study of Quantum Mechanical Asymmetric Infinite Square Wells,” *Honors Thesis Defense*, Physics Department, Davidson College.

April 2006: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “An Analytic Study of Quantum Mechanical Asymmetric Infinite Square Wells,” *Invited Poster*, Decision Davidson.

September 2005: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “Wigging out for the Summer: How I Learned to Stop Worrying and Love Phase Space in Quantum Mechanics,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

September 2004: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “Much Ado About Nothing: A Diversion into Allowable Solutions of the 1-D Schrödinger Equation,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

Summer 2004: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “Wave Packet Revivals in the Asymmetric Infinite Square Well,” *Contributed Talk*, Davidson College Physics Department’s Summer Research Symposium at Davidson College.

May 2003: Adam Abele\*, “Using Java 3D to Visualize Calculations in Advanced Quantum Mechanics,” *Poster*, Spring Research Symposium at Davidson College.

May 2003: Adam Abele\*, “Using Java 3D to Visualize Calculations in Advanced Quantum Mechanics,” *Contributed Talk*, Physics Department Seminar at Davidson College.

September 2002: Kevin Bell\* and Andrew Schoewe\*, “Through the Looking Glass: An Introduction to Supersymmetry, SUSY Quantum Mechanics, and Complex Periodic Potentials,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

Summer 2002: Kevin Bell\* and Andrew Schoewe\*, “Through the Looking Glass: An Introduction to Supersymmetry, SUSY Quantum Mechanics, and Complex Periodic Potentials,” *Contributed Talk*, Davidson College Physics Department’s Summer Research Symposium at Davidson College.

August 2001: Ben Sargent\*, “*PT*-Symmetric Supersymmetric Quantum Mechanics,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

Summer 2001: Ben Sargent\*, “*PT*-Symmetric Supersymmetric Quantum Mechanics,” *Contributed Talk*, Davidson College Physics Department’s Summer Research Symposium at Davidson College.

October 2000: Tim Valdes\*, “Supersymmetric Quantum Mechanics,” *Math Coffee*, Mathematics Department at Davidson College.

September 2000: Tim Valdes\*, “Supersymmetric Quantum Mechanics,” *Contributed Talk*, Davidson College Physics Department’s “What I Did on My Summer Vacation” Seminar at Davidson College.

Summer 2000: Tim Valdes\*, “Supersymmetric Quantum Mechanics,” *Contributed Talk*, Davidson College Physics Department’s Summer Research Symposium at Davidson College.

May 2000: Tim Valdes\*, “Supersymmetric Quantum Mechanics,” *Poster*, Spring Research Symposium at Davidson College.

1998: Matthew Fagen\*, “SUSY,” Talk given as part of a Junior/Senior seminar course at Eckerd College.

1998: Brian Evans\*, “Neutrino Mixing,” Talk given as part of a Junior/Senior seminar course at Eckerd College.

### **Conference Talks and Presentations with Undergraduates (\*)**

October 2017: N. Pruet\* and M. Belloni, “Modelling the Vibrational Structure of S2- Yellow Fluorescence in Scapolites,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pineville, NC.

October 2017: E. Leon\* and M. Belloni, “Supersymmetric Extensions of the Infinite Well: Quantum Wavefunctions and Sum Rules,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pineville, NC.

October 2017: K. Gutierrez\* and M. Belloni, “A Recursive Algorithm to Find Eigenstates of the Supersymmetric Infinite Well,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pineville, NC.

October 2015: V. Hickl\* and M. Belloni, “Using the Spectral Method to Analyze Wave Packet Revivals in the Asymmetric Infinite Square Well,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

October 2015: N. Dokmetzoglou\* and M. Belloni, “Momentum ‘Tails’ of 1D, 2D, AND 3D Quantum Systems,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

April 2015: V. Hickl\* and M. Belloni, “An Analytic Analysis of an Asymmetric Infinite Square Well,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

October 2014: M. Begley\* and M. Belloni, “Analytical Solutions to Quantum Wells Using the Spectral Method,” *Contributed Poster*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pembroke, NC.

April 2014: S. Keller\* and M. Belloni, “Using the Spectral Method to Relate Quantum Half Wells,” *Contributed Poster*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Boone, NC.

October 2010: Leah Ruckle\*, Mario Belloni, and Richard Robinett “The Biharmonic Oscillator and Asymmetric Linear Potentials in the Extreme Quantum Limit,” Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

October 2010: Todd Timberlake, Aaron Titus, Mark Montazer\*, and Mario Belloni, “A Flexible Platform for Teaching Astronomy and Astrophysics,” *Contributed Poster*, North Carolina Astronomers’ Meeting, Raleigh, North Carolina.

February 2010: T. Timberlake, A. Titus, M. Montazer\*, and M. Belloni, “A Flexible Platform for Teaching Astronomy and Astrophysics,” *Contributed Poster*, Joint Winter Meeting of the American Association of Physics Teachers and American Physical Society, Washington, DC.

January 2007: D. Sheibley\*, M. Belloni, M. A. Doncheski, and R. W. Robinett, “Studying a Quantum ‘Bounce’,” *Contributed Talk*, Joint Winter Meeting of the American Association of Physics Teachers and the American Astronomical Society, Seattle, Washington.

January 2007: R. Correll\*, M. Belloni, and W. Christian, “Packets in the Classical Asymmetric Infinite Square Well,” *Contributed Talk*, Joint Winter Meeting of the American Association of Physics Teachers and the American Astronomical Society, Seattle, Washington.

September 2006: D. Sheibley\*, M. Belloni, M. A. Doncheski, and R. W. Robinett, “Studying a Quantum ‘Bounce’,” *Contributed Poster*, Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Elon, North Carolina.

September 2006: Robert Correll\*, Mario Belloni, and Wolfgang Christian, “Packets in the Classical Asymmetric Infinite Square Well,” *Contributed Poster*, Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Elon, North Carolina.

April 2006: M. A. Doncheski, R. W. Robinett, L. P. Gilbert\*, and M. Belloni, “Fun with a Square Well,” *Contributed Talk*, Central Pennsylvania Section of the American Association of Physics Teachers, Pennsylvania College of Technology, Williamsport, Pennsylvania.

March 2006: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “An Analytic Study of Quantum Mechanical Asymmetric Infinite Square Wells,” *Contributed Poster*, Joint Meeting of North

Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Belmont, North Carolina.

November 2005: Mario Belloni, Laura Gilbert\*, Michael Doncheski, and Richard Robinett, “An Analytic Study of Energy Eigenstates of Piecewise-constant Potentials Using the Wigner Quasi-probability Distribution,” *Contributed Talk*, Joint Meeting of the Southeastern Section of the American Physical Society and the Florida Section of the American Association of Physics Teachers, Gainesville, Florida.

October 2005: Laura Gilbert\*, “The Pedagogy of the Asymmetric Infinite Square Well,” *Invited Talk*, North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

January 2005: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “Wave Packet Revivals in the Asymmetric Infinite Square Well,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Albuquerque, New Mexico.

October 2004: Mario Belloni, Laura Gilbert\*, Michael Doncheski, and Richard Robinett, “Much Ado About Nothing: A Diversion into Allowable Solutions of the 1-D Schrödinger Equation,” *Contributed Talk*, Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

October 2004: Laura Gilbert\*, Mario Belloni, Michael Doncheski, and Richard Robinett, “Wave Packet Revivals in the Asymmetric Infinite Square Well,” *Contributed Poster*, Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

November 2003: Kevin Bell\*, Andrew Schoewe\*, and Mario Belloni, “Hill’s Equation and SUSY QM: Solving Periodic  $PT$ -symmetric Differential Equations,” *Contributed Poster*, Joint Meeting of the Southeastern Section of the American Physical Society and the North Carolina Section of the American Association of Physics Teachers, Wilmington, North Carolina.

August 2003: Mario Belloni, Adam Abele\*, and Wolfgang Christian, “One-, Two-, and Three-dimensional Quantum Mechanics Using Java3D,” *Contributed Talk*, Summer Meeting of the American Association of Physics Teachers, Madison, Wisconsin.

April 2003: Adam Abele\*, “Using Java 3D to Visualize Problems in Classical and Quantum Mechanics,” *Invited Poster*, Sigma Xi Undergraduate Research Awards, Charlotte, North Carolina.

April 2003: Kevin Bell\*, Andrew Schoewe\*, and Mario Belloni, “Using Hill’s Equation to Solve  $PT$ -Symmetric Periodic Differential Equations,” *Contributed Talk*, Joint Meeting of the American Physical Society and the Division of Particles and Fields, Philadelphia, Pennsylvania.

January 2003: Andrew Schoewe\*, Kevin Bell\* and Mario Belloni, “Solving  $PT$ -Symmetric Periodic Potentials Using Hill’s Equation,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

June 2002: Mario Belloni, Kevin Bell\*, Ben Sargent\*, and Andrew Schoewe\*, “Determining the Energy Spectrum of a  $PT$ -Symmetric Periodic Potential,” *Contributed Poster*, Gordon Research Conference on Physics Research and Education: Quantum Mechanics, South Hadley, Massachusetts.

March 2002: Mario Belloni and Meghan Carroll\*, “Using a Computer-Rich Curriculum to Teach Quantum Mechanics,” *Contributed Talk*, North Carolina Section of the American Association of Physics Teachers, Winston Salem, North Carolina.

January 2002: Ben Sargent\* and Mario Belloni, “*PT*-Symmetric Periodic Potentials within Supersymmetric Quantum Mechanics,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

November 2001: Ben Sargent\* and Mario Belloni, “*PT*-Symmetric Supersymmetric Quantum Mechanics,” *Contributed Poster*, Southeastern Section of the American Physical Society, Charlottesville, Virginia.

### **Invited Conference and Seminar Talks**

February 2015: M. Belloni, “Know Your BOUNDARIES: How the Infinite Square Well Can Teach You More Than Just Introductory Quantum Mechanics” *Emory University Physics Seminar*.

July 2014: W. Christian and M. Belloni, “Remembering John Risley,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Minneapolis, Minnesota.

July 2014: M. Belloni, W. Christian, and K. Thompson, “Writing Electronic Books with Interactive Curricular Material,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Minneapolis, Minnesota.

November 2013: Mario Belloni, “Astronomy Make and Take,” *Invited Talk*, part of the “Physics Day at NSTA,” Day-long set of talks at the Charlotte Regional NSTA Meeting.

April 2013: Mario Belloni, “Astrophotography on the Cheap: How to Make the Most of Your Equipment,” *Invited Talk*, Charlotte Area Astronomy Club, Charlotte, North Carolina.

January 2013: Mario Belloni, “Visualizing the Invisible Universe: From the Very Large to the Very Small,” *Invited Talk*, Charlotte Teachers Institute, Exploding Canons, All the Time in the WORLD, Charlotte, North Carolina.

January 2013: Mario Belloni, Wolfgang Christian, and Todd Timberlake, “Using Open Source Physics, Moodle and iPads to Teach Astronomy,” *Invited Talk*, Winter Meeting of the American Association of Physics Teachers, New Orleans, Louisiana.

August 2012: Mario Belloni, “Teaching Astronomy: A Physicist’s Guide,” *Invited Talk*, Global Physics Department, [globalphysicsdept.org/](http://globalphysicsdept.org/).

September 2011: M. Belloni, W. Christian, and F. Esquembre, “Aligning EJS Simulations from the ComPADRE OSP Collection with the United States High School Physics Teaching Standards,” *Plenary Talk*, Joint MPTL-HSCI Meeting, University of Ljubljana, Slovenia.

January 2011: M. Belloni, “Using Physlets and Easy Java Simulations to Teach Physics and Astronomy,” *Invited Cracker Barrel Talk*, Summer Meeting of the American Association of Physics Teachers, Omaha, Nebraska.

January 2011: M. Belloni, W. Christian, and T. Timberlake, “EJS and Open Source Physics: Teaching with Interactive Materials Across the Curriculum,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Omaha, Nebraska.

January 2011: Mario Belloni, Wolfgang Christian, Anne Cox, and Todd Timberlake, “The Evolution of the OSP ComPADRE Collection,” *Invited Talk*, Winter Meeting of the American Association of Physics Teachers, Jacksonville, Florida.



July 2010: Todd Timberlake and Mario Belloni, “A Flexible Platform for Teaching Astronomy and Astrophysics,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Portland, Oregon.

March 2010: M. Belloni, “How to Find Elusive Exoplanets,” *Faculty Lecture*, Davidson College, Davidson, NC.

December 2009: M. Belloni, “Using Physlets and Easy Java Simulations to Teach Physics and Astronomy,” *Invited Presentation*, Symposium on Horizons in Astronomy and Physics Education, Department of Physics and Astronomy, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

July 2009: M. Belloni, “Using Technology to Increase Student Engagement Inside and Outside of the Classroom,” *Excellence in Undergraduate Physics Teaching Award Talk*, Summer Meeting of the American Association of Physics Teachers, Ann Arbor, Michigan.

March 2009: M. Belloni, “Physlets and EJS Modeling for High School Physics Courses,” Presentation at the Optics and Photonics Workshop, Science House, Raleigh, North Carolina.

March 2009: M. Belloni, “Open Source Physics: Computational Tools for Teaching,” *Physics Seminar*, University of Maryland, Baltimore County, Baltimore, Maryland.

October 2008: W. Christian and M. Belloni, "Teaching with Interactive Simulations," *Invited Talk*, Physics Day at NSTA sponsored by the North Carolina Section of the American Association of Physics Teachers and the American Association of Physics Teachers, Charlotte, North Carolina.

January 2008: M. Belloni and W. Christian, “Using ComPADRE and BQ to Distribute and Improve Interactive Curricular Material,” *Invited Talk*, Winter Meeting of the American Association of Physics Teachers, Baltimore, Maryland.

February 2007: M. Belloni, “Teaching Quantum Mechanics in the 21st Century: Recent Advances,” *Physics Department Colloquium*, University of Connecticut, Storrs, Connecticut

January 2007: M. Belloni, “Teaching Quantum Mechanics in the 21st Century: Recent Advances,” *Physics Department Colloquium*, Duke University, Durham, North Carolina.

April 2006: Chandralekha Singh, Mario Belloni, and Wolfgang Christian, “Improving Student Learning of Quantum Mechanics,” *Invited Talk*, April Meeting of the American Physics Society, Dallas, Texas.

January 2006: Mario Belloni and Wolfgang Christian, “Making Quantum Mechanics Visual and Interactive with Physlet- and OSP-Based Curricular Material,” *Invited Talk*, Winter Meeting of the American Association of Physics Teachers, Anchorage, Alaska.

November 2005: Making Quantum Mechanics Visual and Interactive with Physlet- and OSP-Based Curricular Material,” Mario Belloni, *Invited Talk*, Joint Meeting of the Southeastern Section of the American Physical Society and the Florida Section of the American Association of Physics Teachers, Gainesville, Florida.

September 2005: Mario Belloni and Wolfgang Christian, “Using Open Source Physics to Visualize Advanced Problems from Classical to Quantum Mechanics,” *Invited Talk*, 10th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Berlin, Germany.

June 2005: Wolfgang Christian and Mario Belloni, “Open Source Physics,” *Invited 4-hour Presentation*, National Computational Science Institute: Computational Physics for Physics Educators, High Point, North Carolina.

May 2005: Mario Belloni, “What Can ‘Einstein’s Miraculous Year’ Teach Us about Physics and Physics Education?,” *Keynote Address*, Triangle Society Leadership Dinner, Discovery Place, Charlotte, North Carolina.

April 2005: Mario Belloni, “Quantum Mechanics,” *Invited Presentation*, Charlotte Latin School, Charlotte, North Carolina.

October 2004: Mario Belloni and Wolfgang Christian, Using Java-based Material to Enhance Learning: From Introductory Physics to Quantum Mechanics, *Plenary Talk* at a Symposium on “Teaching 20th Century Physics in the 21st Century,” Joint Meeting of the Michigan Section of the American Association of Physics Teachers and the Ohio Section of the American Physical Society, Auburn Hills, Michigan.

August 2004: Mario Belloni and Wolfgang Christian, “Research with Students: The Interplay between Theory, Computation, and Education,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Sacramento, California.

April 2004: Mario Belloni and Wolfgang Christian, Using Java-based Material to Enhance Learning: From Introductory Physics to Quantum Mechanics, *Plenary Talk*, Joint Meeting of the Texas Section of the American Physical Society and the Texas Section of the American Association of Physics Teachers, Stephenville, Texas.

January 2004: Wolfgang Christian and Mario Belloni, “Computer-Rich Interactive Material for Teaching Special and General Relativity,” *Invited Talk*, Winter Meeting of the American Association of Physics Teachers, Miami, Florida.

September 2003: Wolfgang Christian and Mario Belloni, “Developing an Open Source Library and Programs for Science and Mathematics,” *Invited Talk*, EUROCON conference, Ljubljana, Slovenia.

September 2003: Wolfgang Christian, Mario Belloni, Melissa H. Dancy, and Anne J. Cox, “Authoring and Assessing Physlet®-based Interactive Curricular Material,” *Invited Talk*, EUROCON conference, Ljubljana, Slovenia.

June 2003: Wolfgang Christian, Mario Belloni, Melissa H. Dancy and Anne J. Cox, “Physlet-based Interactive Curricular Material,” *Invited Talk*, Computer Modeling Conference, St. Petersburg, Russia.

June 2003: Wolfgang Christian and Mario Belloni, “Developing an Open Source Code Library for Science and Mathematics Teachers and Curriculum Authors,” *Invited Talk*, Computer Modeling Conference, St. Petersburg, Russia.

April 2003: Mario Belloni, “Making Quantum Mechanics Visual and Interactive with Physlet-Based Curricular Material,” *Invited Talk*, Joint Meeting of the American Physical Society and the Division of Particles and Fields, Philadelphia, Pennsylvania.

October 2002: Melissa Dancy, Wolfgang Christian, and Mario Belloni, “Assessment and Development of Java-Based Applets for Instruction,” *Colloquium*, University of North Carolina-Charlotte, Charlotte, North Carolina.

September 2002: Mario Belloni, and Wolfgang Christian “Enhancing Student Learning with Physlet-based Just-in-Time Teaching,” *Invited Talk*, MERLOT International Conference, Atlanta, Georgia.

September 2002: Wolfgang Christian and Mario Belloni, “Physlets: Web-based Java Applets for Physics Education,” *Invited Talk at the MERLOT Awards Session*, MERLOT International Conference, Atlanta, Georgia.

September 2002: Mario Belloni and Wolfgang Christian, “Using Physlets to Teach Quantum Mechanics,” *Invited Plenary Talk*, 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Parma, Italy.

August 2002: Mario Belloni, “The Development and Assessment of Interactive Exercises for Quantum Mechanics,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Boise, Idaho.

June 2002: Mario Belloni, “Physlet-Based Media-Focused Education: Making Quantum Mechanics Visual and Interactive,” *Invited Special Curriculum Session*, Gordon Research Conference on Physics Research and Education: Quantum Mechanics, South Hadley, Massachusetts.

April 2002: Mario Belloni, “Making Quantum Mechanics Interactive with Physlets and Just-in-Time Teaching,” *Colloquium*, Physics Department, Indiana University-Purdue University, Indianapolis, Indianapolis, Indiana.

April 2002: Mario Belloni, Melissa Dancy, and Wolfgang Christian, “Using Physlet-Based Interactive Exercises to Enhance Student Learning,” *Invited Talk*, Spring Meeting of the Southern Atlantic Coast Section of the American Association of Physics Teachers, Gainesville, Georgia.

February 2002: Mario Belloni, Wolfgang Christian and Aaron Titus, “Enhancing Student Learning with Physlet-based Just-in-Time Teaching,” *Invited Talk*, Invitational Conference on K-12 Outreach from University Science Departments: Using Technology to Link the Classroom to the Laboratory (and Murphy to Manteo), Raleigh, North Carolina.

November 2001: Larry Cain, Mario Belloni, and Wolfgang Christian, “Using Just-in-Time Teaching and Physlets in Undergraduate Quantum Mechanics,” *Invited Talk*, Meeting of the Southeastern Section of the American Physical Society, Charlottesville, Virginia.

July 2001: Mario Belloni, Larry Cain, and Wolfgang Christian, “Using Physlets and Just-in-Time Teaching in Quantum Mechanics,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Rochester, New York.

May 2001: Wolfgang Christian, Mario Belloni, and Melissa Dancy, “Physlets: Java Tools for a Web-based Physics Curriculum,” *Invited Talk*, International Conference on Computational Science, San Francisco, California.

November 2000: Mario Belloni, “Physlets Across the Curriculum at Davidson College,” *Invited Talk*, Meeting of the Southeastern Section of the American Physical Society, Starkville, Mississippi.

October 2000: Mario Belloni, “Using Interactive Curricular Material to Enhance Student Learning,” *Colloquium*, University of Connecticut, Storrs, Connecticut.

August 2000: Mario Belloni and Wolfgang Christian, “Physlets and Just-in-Time Teaching: From Introductory to Advanced Physics Courses,” *Invited Talk*, Summer Meeting of the American Association of Physics Teachers, Guelph, Ontario, Canada.

June 2000: Mario Belloni, “Just-in-Time Teaching in the Laboratory,” *Invited Presentation*, Summer Technology Workshop of the Associated Colleges of the South, Austin, Texas.

April 2000: Mario Belloni and Wolfgang Christian, “A New Approach to Authoring Interactive Curricular Material,” *Invited Talk*, Joint Spring Meeting of the New England Section of the American Physical Society and the American Association of Physics Teachers, Providence, Rhode Island.

March 2000: Mario Belloni and Wolfgang Christian, “Physlets and Just-in-Time Teaching: From Introductory to Advanced Physics Courses,” *Invited Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

September 1999: Mario Belloni, “SUSY, GUTs, TOEs, and TUTs,” *Invited Joint Seminar* at Virginia Military Institute and Washington and Lee University, Lexington, Virginia.

1998: “SUSY, GUTs, TOEs and TUTs,” *Invited Seminar*, Eckerd College, Saint Petersburg, Florida.

1997: “Symmetry and Conservation Laws: From Electromagnetism to QCD,” *Invited Seminar*, Wheaton College, Wheaton, Massachusetts.

1995: “Implementing Gauss's Law in QCD,” *Invited Seminar*, The Ohio State University, Columbus, Ohio.

### **Contributed Conference and Seminar Talks**

October 2015: W. Christian and M. Belloni, “AAPT/ComPADRE Books,” *Contributed Talk*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, NC.

April 2015: K. Thompson and M. Belloni, “Student Response to the Use of eBooks in Introductory Astronomy,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Wake Forest, NC.

April 2014: M. Belloni, W. Christian, and K. Thompson, “Writing Electronic Books with Interactive Curricular Material,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Boone, NC.

October 2013: M. Belloni and W. Christian, “Physlets on ComPADRE,” *Contributed Talk*, Joint Fall Meeting of the South Atlantic Coast Section and the North Carolina Section of the American Association of Physics Teachers, Greenville, South Carolina.

October 2013: W. Christian and M. Belloni, “How to Develop JavaScript Models for Tablets,” *Contributed Talk*, Joint Fall Meeting of the South Atlantic Coast Section and the North Carolina Section of the American Association of Physics Teachers, Greenville, South Carolina.

April 2013: M. Belloni and W. Christian, “The History and Future of Physlets,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

April 2013: W. Christian and M. Belloni, “Teaching with Moodle and OSP Plugins,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

June 2012: M. Belloni, W. Christian, and D. Brown, “Teaching Astronomy Using Tracker,” *Contributed Poster*, Gordon Research Conference on Physics Research and Education: Astronomy, Colby College, Waterville, Maine.

June 2012: C. Niederriter and M. Belloni, “Astrophotography on the Cheap,” *Contributed Poster*, Gordon Research Conference on Physics Research and Education: Astronomy, Colby College, Waterville, Maine.

July 2012: M. Belloni, W. Christian, and D. Brown, “Using Tracker to Measure the Solar Rotation Rate,” *Contributed Video* at the AAPT Vidshare Crackerbarrel, Summer Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

November 2011: Mario Belloni, “Using Tracker to Measure the Length of the Sidereal Day,” *Contributed Talk*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Asheville, North Carolina.

October 2010: Wolfgang Christian and Mario Belloni, “Aligning OSP Models with Teaching Standards,” *Contributed Talk*, Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

November 2009: B. Mason, W. Christian, F. Esquembre, and M. Belloni, “Open Source Physics Content Delivery: Computation, Curriculum, and Libraries,” *Contributed Talk*, 2009 NSDL Annual Meeting, Washington DC.

October 2009: M. Belloni and T. Timberlake, “A Flexible Platform for Teaching Astronomy,” *Contributed Talk*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

July 2009: M. Belloni and W. Christian, “Using Easy Java Simulations to Model a Rolling and Slipping Wheel,” *Contributed Poster*, Summer Meeting of the American Association of Physics Teachers, Ann Arbor, Michigan.

March 2009: M. Belloni and W. Christian, “Using Easy Java Simulations to Model a Rolling and Slipping Wheel,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Hickory, North Carolina.

March 2009: W. Christian and M. Belloni, “A Proposal for a Digital Library of Computer Models for NC High School Teachers,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Hickory, North Carolina.

June 2008: M. Belloni and W. Christian, “Open Source Physics Quantum Mechanics Materials,” *Contributed Poster*, Gordon Research Conference on Physics Research and Education: Computation and Computer-Based Instruction Bryant University, Smithfield, Rhode Island.

October 2007: M. Belloni and K. Rathbun, “Redesigning the Second Semester Physics Course at Davidson College,” *Contributed Talk*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, High Point, North Carolina.

July 2007: M. Belloni, and W. Christian, “Curriculum Development at Davidson College,” *Contributed Poster*, Summer Meeting of the American Association of Physics Teachers, Greensboro, North Carolina.

July 2007: W. Christian, M. Belloni, and Francisco Esquembre “Modeling with Easy Java Simulations,” *Contributed Poster*, Summer Meeting of the American Association of Physics Teachers, Greensboro, North Carolina.

July 2007: M. Belloni, and W. Christian, “OSP Quantum Mechanics: Interactive Computer-Based Curricular Material,” *Contributed Poster*, AAPT Topical Conference: Computational Physics for Upper Level Courses Davidson College, Davidson, North Carolina.

March 2007: M. Belloni, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” *Contributed Talk*, North Carolina Section of the American Association of Physics Teachers Meeting, Greensboro, North Carolina.

September 2006: Wolfgang Christian and Mario Belloni, “Open Source Physics Curriculum Material for Relativity,” *Contributed Talk*, Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Elon, North Carolina

September 2006: M. Belloni and W. Christian, “Enhancing Student Learning with Interactive Physlet- and OSP-Based Curricular Material,” *Contributed Talk*, Third International Conference on Hands-on Science, HSCI' 2006, Braga, Portugal.

July 2006: Wolfgang Christian, Mario Belloni, and Anne J. Cox, “Open Source Physics Curriculum Material for Teaching Relativity,” *Contributed Poster*, AAPT Topical Conference: Teaching General Relativity to Undergraduates, Syracuse, New York.

June 2006: Mario Belloni and Wolfgang Christian, “Open Source Physics Curriculum Material for Teaching Electromagnetism,” *Contributed Poster*, Gordon Research Conference on the Research and Teaching of Electromagnetism, Mt. Holyoke, Massachusetts.

March 2006: Mario Belloni and Wolfgang Christian, “Teaching Wave Function Shape in Introductory Physics with Physlets,” *Contributed Talk*, Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Belmont, North Carolina.

August 2005: Mario Belloni and Chandralekha Singh, “Open Source Physics for Quantum Mechanics: Programs and Tutorials,” *Contributed Poster*, Summer Meeting of the American Association of Physics Teachers, Salt Lake City, Utah.

March 2005: Mario Belloni and Wolfgang Christian, “Classical and Quantum-mechanical Jeopardy,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

March 2005: Wolfgang Christian and Mario Belloni, “The Spacetime Metric,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

January 2005: Anne J. Cox, Mario Belloni and Wolfgang Christian, “Evaluation of Physlet®-based Materials,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Albuquerque, New Mexico.

October 2004: Mario Belloni, Michael Doncheski, and Richard Robinett, “Visualizing Wave Packet Dynamics in the Infinite Square Well Using the Wigner Quasi-probability Distribution,” *Contributed Talk*, Joint Meeting of the Michigan Section of the American Association of Physics Teachers and the Ohio Section of the American Physical Society, Auburn Hills, Michigan.

September 2004: Wolfgang Christian and Mario Belloni, “Innovative Curriculum Development Initiatives for Physics in the United States,” *Contributed Talk*, 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Graz, Austria.

September 2004: Anne J. Cox, Mario Belloni, and Wolfgang Christian, “Multimedia curricular material informed by physics education research: Physlet®-Based Ranking Task Exercises,” *Contributed Poster*, 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Graz, Austria.

August 2004: Wolfgang Christian and Mario Belloni, “The Impact of NSF Support on Professional Activity at a Liberal Arts College,” *Contributed Talk*, Summer Meeting of the American Association of Physics Teachers, Sacramento, California.

May 2004: Mario Belloni, Michael Doncheski, and Richard Robinett, “Wave Packet Dynamics in the Infinite Square Well with the Wigner Quasi-probability Distribution,” *Contributed Talk*, April Meeting of the American Physical Society, Denver, Colorado.

May 2004: Mario Belloni and Wolfgang Christian, “Making Quantum Mechanics Visual and Interactive with Web-Based Curricular Material,” *Contributed Talk*, April Meeting of the American Physical Society, Denver, Colorado.

April 2004: Mario Belloni and Wolfgang Christian, The Impact of NSF Support on Professional Activity at a Liberal Arts College, *Contributed Poster*, Invention and Impact: Building Excellence in Undergraduate STEM Education, a National Science Foundation Course, Curriculum, and Laboratory Improvement (NSF-CCLI) program conference, Arlington, Virginia.

April 2004: Mario Belloni, Michael Doncheski, and Richard Robinett, “Using the Wigner Quasi-probability Distribution for Wave Packet Dynamics in the Infinite Square Well,” *Contributed Talk*, Joint Meeting of the Texas Section of the American Physical Society and the Texas Section of the American Association of Physics Teachers, Stephenville, Texas.

March 2004: Mario Belloni and Wolfgang Christian, “Visualizing Quantum Mechanical Revivals,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

March 2004: Wolfgang Christian and Mario Belloni, “Diffraction Algorithms and Their Visualization,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

March 2004: Tim Gfroerer, Mario Belloni, and Wolfgang Christian, “Physlet-based Special Relativity Exercises for Introductory Laboratory,” *Contributed Talk*, March Meeting of the American Physical Society, Montreal, Canada.

January 2004: Anne J Cox, William F. Junkin III, Mario Belloni, and Wolfgang Christian, “Database of Physlet®-based Exercises for Introductory Physics,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Miami, Florida.

January 2004: Mario Belloni, Wolfgang Christian, and Anne J. Cox, “Physlet-Based Ranking Tasks: From Introductory Physics to Quantum Mechanics,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Miami, Florida.

November 2003: Mario Belloni, Richard Robinett, and Michael Doncheski, “The Time Evolution and Partial Revivals of a Particle in an Asymmetric Well,” *Contributed Talk*, Joint Meeting of the Southeastern Section of the American Physical Society and the North Carolina Section of the American Association of Physics Teachers, Wilmington, North Carolina.

November 2003: Mario Belloni and Wolfgang Christian, “Physlet-Based Ranking Tasks: From Introductory Physics to Quantum Mechanics,” *Contributed Talk*, Joint Meeting of the Southeastern Section of the American Physical Society and the North Carolina Section of the American Association of Physics Teachers, Wilmington, North Carolina.

November 2003: Wolfgang Christian and Mario Belloni, Curriculum Development and Open Source Physics Workshops,” *Contributed Talk*, Joint Meeting of the Southeastern Section of the American Physical Society and the North Carolina Section of the American Association of Physics Teachers, Wilmington, North Carolina.

August 2003: Wolfgang Christian and Mario Belloni, “Report on the First Open Source Physics Workshops,” *Contributed Talk*, Summer Meeting of the American Association of Physics Teachers, Madison, Wisconsin.

July 2003: Ernesto Martín, Francisco Esquembre, Wolfgang Christian, y Mario Belloni, “Enseñando Física con los Fislets,” *Contributed Talk*, VIII Conferencia Interamericana sobre Educación en la Física, Havana, Cuba.

July 2003: Melissa Dancy, Mario Belloni, Anne Cox, Wolfgang Christian, and Aaron Titus, “Curricular Development and Assessment of Physlets<sup>®</sup> for Introductory Physics,” *Contributed Poster*, Enrico Fermi Summer School on Physics Education Research, Varenna, Italy.

March 2003: Mario Belloni and Wolfgang Christian, “Interactive Demonstrations and Exercises for a Course in Mathematical Methods,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Greensboro, North Carolina.

January 2003: Tim Gfroerer and Mario Belloni, “Physlet-Based Harmonic Oscillation Simulations for Intermediate Mechanics,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

January 2003: Wolfgang Christian and Mario Belloni, “Keeping Up with Physlets Technology and Pedagogy,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

January 2003: Melissa Dancy, Wolfgang Christian and Mario Belloni, “Development of Physlet-Based, Tutorial Style Curricular Materials,” *Contributed Talk*, Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

November 2002: Mario Belloni and Wolfgang Christian, “Using Physlets to Teach Special Relativity,” *Contributed Talk*, Joint Fall Meeting of the North Carolina and Southern Atlantic Coast Sections of the American Association of Physics Teachers, Asheville, North Carolina.

September 2002: Mario Belloni, “A Brief Report on Available Multimedia Materials in the USA,” *Contributed Talk*, 7th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Parma, Italy.

September 2002: Mario Belloni and Wolfgang Christian, “Present and Future Developments of Physlets,” *Contributed Presentation*, CoLoS Meeting, Paris, France.

August 2002: Wolfgang Christian and Mario Belloni, “Distributing Physlet-based Curricular Material Using MERLOT,” *Contributed Talk*, Summer Meeting of the American Association of Physics Teachers, Boise, Idaho.

August 2002: Larry Cain, Mario Belloni, Dan Boye, Wolfgang Christian, Tim Gfroerer, and John Yukich, “Incorporating Just-in-Time-Teaching into the Introductory Physics Laboratory,” *Contributed Talk*, Summer Meeting of the American Association of Physics Teachers, Boise, Idaho.

June 2002: Mario Belloni, “Time-Dependent Superpositions in Symmetric Potentials: How the Parity of the Wave Function Affects Expectation Values,” *Contributed Poster*, Gordon Research Conference on Physics Research and Education: Quantum Mechanics, South Hadley, Massachusetts.



November 2001: Mario Belloni, “Lessons Learned from Using Just-in-Time Teaching and Interactive Curricular Materials,” *Seminar*, Joint NOAH, Academic Affairs, and ITS, Teaching with Technology Seminar, Davidson College, Davidson, North Carolina.

November 2001: Mario Belloni and Kurt Haller, “A Different View of the Schwinger Model,” *Contributed Talk*, Meeting of the Southeastern Section of the American Physical Society, Charlottesville, Virginia.

July 2001: Melissa Dancy, Wolfgang Christian, Mario Belloni, and Ken Krebs, “Physlet-Based Curriculum Materials: Optics,” *Contributed Poster*, Summer Meeting of the American Association of Physics Teachers, Rochester, New York.

March 2001: Mario Belloni and Wolfgang Christian, “Enhancing Student Learning with Interactive Curricular Material,” *Contributed Talk*, Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

October 2000: Mario Belloni, “Using Physlets and Just-in-Time Teaching to Enhance Ranking-Task Exercises,” *Contributed Talk*, Joint Meeting of the South Atlantic and North Carolina Sections of the American Association of Physics Teachers, Spartanburg, South Carolina.

August 1999: Mario Belloni, “Next Generation Media-Focused Problems,” *Contributed Talk*, 1999 Summer Meeting of the American Association of Physics Teachers, San Antonio, Texas.

1999: Mario Belloni and John Yukich, “Engaging Students Inside and Outside the Classroom,” *Seminar*, NOAH, Davidson College, Davidson, North Carolina.

1998: Mario Belloni and Wolfgang Christian, “The Pedagogic Effectiveness and Student Reaction to Web-Based Interactive Problems,” *Contributed Talk*, Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Asheville, North Carolina.

1996: “Gauss’s Law and Gauge Invariance in QCD,” *Contributed Talk*, Sixth International Workshop of Light-Front Quantization and Non-Perturbative QCD, Ames, Iowa.

1992: “Constrained States in QCD,” *Contributed Talk*, Second International Workshop on Light-Front Quantization and Non-Perturbative QCD, Telluride, Colorado.

## **Workshops**

June 2018: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

November 2016: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

July 2016: Co-leader and co-organizer of the professional development workshop, “Creating Interactive Electronic Books for Computers and Tablets,” Summer Meeting of the American Association of Physics Teachers, Sacramento, California.

June 2016: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

March 2016: Co-leader and co-organizer of the professional development workshop, “Help, I’m a physics teacher who is teaching astronomy,” Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Elon, North Carolina.

November 2015: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

June 2015: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

January 2015: Co-leader and co-organizer of the professional development workshop, “Astronomy and Physics Simulations for Computers and Tablets,” Winter Meeting of the American Association of Physics Teachers, San Diego CA.

November 2014: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

July 2014: Co-leader and co-organizer of the professional development workshop, “Using and Adapting Easy Java/JavaScript Simulations for an Interactive Classroom,” Summer Meeting of the American Association of Physics Teachers, Minneapolis, Minnesota.

June 2014: Co-leader and co-organizer of the professional development workshop, “Tracker and Open Source Physics,” Workshop for the *College Ready in Mathematics and Physics Project*, Fayetteville, Arkansas.

November 2013: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

November 2013: Co-organizer and co-leader for the “Physics Day at NSTA,” Day-long set of talks at the Charlotte Regional NSTA Meeting.

July 2013: Co-leader and co-organizer of the professional development workshop, “Teaching with Moodle and OSP Plugins,” Summer Meeting of the American Association of Physics Teachers, Portland, Oregon.

June 2013: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

June 2013: Co-leader and co-organizer of the professional development workshop, “Tracker and Open Source Physics,” Workshop for the *College Ready in Mathematics and Physics Project*, Fayetteville, Arkansas.

November 2012: Co-organizer and co-leader for the “Laboratory Tools for Introductory Physics (ASIP) Workshop,” Lee College, Baytown, Texas.

July 2012: Co-leader and co-organizer of the PTRA professional development workshop, “Using and Adapting OSP- and Physlet-Based Materials for an Interactive Classroom,” Summer Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

July 2012: Co-leader and co-organizer of the professional development workshop, “From Ptolemy to Einstein: Using Computer Simulations in Astronomy,” Summer Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

June 2012: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

June 2012: Co-leader and co-organizer of the professional development workshop, “Tracker and Open Source Physics,” Workshop for the *College Ready in Mathematics and Physics Project*, Fayetteville, Arkansas.

January 2012: Co-leader and co-organizer of the professional development workshop, “Modeling Amusement Park Physics,” Winter Meeting of the American Association of Physics Teachers, Ontario, California.

September 2011: Co-leader and co-organizer of the professional development workshop, “Open Source Physics,” Joint MPTL-HSCI Meeting, University of Ljubljana, Slovenia.

August 2011: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Summer Meeting of the American Association of Physics Teachers, Omaha, Nebraska.

July 2011: Co-organizer and co-leader of 2, 8-hour workshops, “Developing Interactive Java-Based Pedagogy in the Classroom,” PTRA (Physics Teaching Resource Agents) Workshop, Omaha, Nebraska.

June 2011: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

January 2011: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Winter Meeting of the American Association of Physics Teachers, Jacksonville, Florida.

October 2010: Workshop Leader and Organizer for the “For the New Teacher Workshop,” Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

July 2010: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Summer Meeting of the American Association of Physics Teachers, Portland.

June 2010: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

April 2010: Co-leader and co-organizer of the professional development workshop, “Teaching Physics and Astronomy Using EJS Models,” Meeting of the North Carolina Section of the American Association of Physics Teachers, Elon, NC.

February 2010: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Winter Meeting of the American Association of Physics Teachers, Washington, DC.

January-February 2010: Co-leader and co-organizer of the professional development series of 6 presentations, “Physics and Astronomy Content and Standards for K-8,” Morehead Elementary, Charlotte, NC.

November 2009: Co-leader and co-organizer of the professional development workshop, “Easy Java Simulations and the Open Source Physics Project,” Super Computing 2009 (SC09) Education Program, Portland, Oregon.

June 2009: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

January 2009: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Winter Meeting of the American Association of Physics Teachers, Chicago, Illinois.

November 2008: Co-leader and co-organizer of the professional development workshop, “Easy Java Simulations and the Open Source Physics Project,” Super Computing 2008 (SC08) Education Program, Austin Texas.

November 2008: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

October 2008: Leader and organizer of the day-long session, Physics Day at NSTA sponsored by the North Carolina Section of the American Association of Physics Teachers and the American Association of Physics Teachers, Charlotte, North Carolina.

July 2008: Co-leader and co-organizer of the professional development workshop, “Open Source Physics-Statistical and Thermal Physics,” American Association of Physics Teachers Summer Meeting, Edmonton, Alberta, Canada.

July 2008: Co-leader and co-organizer of two, full-day professional development workshops, “Easy Java Simulations to Model Introductory and Advanced Mechanics,” Physics Teachers Resource Agents (PTRA) Summer Institute, Edmonton, Alberta, Canada.

June 2008: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

June 2008: Co-leader and co-organizer of the professional development workshop, “Computational Physics and Parallel Environments,” Super Computing 2008 (SC08) Summer Education Workshops, Kean University, New Jersey.

January 2008: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” Winter Meeting of the American Association of Physics Teachers, Baltimore, Maryland.

November 2007: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

October 2007: Co-leader and co-organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” North Carolina Section of the American Association of Physics Teachers Meeting, High Point, North Carolina.

June 2007: Workshop Leader for the “Workshop Reunion for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

March 2007: Leader and organizer of the professional development workshop, “Using Easy Java Simulations to Model Introductory and Advanced Mechanics,” North Carolina Section of the American Association of Physics Teachers Meeting, Greensboro, North Carolina.

January 2007: Co-leader and co-organizer of the professional development workshop, “Exploring Special and General Relativity with Interactive Curricular Material,” Joint Winter Meeting of the American Association of Physics Teachers and American Astronomical Society, Seattle, WA.

November 2006: Co-organizer and co-leader for the “Adaptable Simulations for Introductory Physics (ASIP) Workshop,” Lee College, Baytown, Texas.

October 2006: Workshop Leader for the “Workshop for New Physics and Astronomy Faculty,” American Center for Physics, College Park, Maryland.

September 2006: Organizer and leader of the workshop, “Using and Adapting OSP- and Physlet-Based Materials for an Interactive Classroom,” Third International Conference on Hands-on Science, HSCI' 2006, Braga, Portugal.

July 2006: Co-organizer and co-leader of the workshop, “Open Source Physics,” Summer Meeting of the American Association of Physics Teachers, Syracuse, New York.

March 2006: Co-organizer and co-leader of the special 4-hour workshop, “Quantum Mechanics with Interactive Computer-based Tutorials,” March Meeting of the American Physical Society, Baltimore, Maryland.

March 2006: Co-organizer and co-leader of the workshop, “Using and Adapting Physlet-Based Materials in the Classroom,” Teacher’s Day at the March Meeting of the American Physical Society, Baltimore, Maryland.

January 2006: Co-leader and co-organizer of the professional development workshop, “Time-dependent Phenomena in Quantum Mechanics: Theory, Experiment, and Computer Tools,” Winter Meeting of the American Association of Physics Teachers, Anchorage, Alaska.

October 2005: Co-organizer and co-leader of the workshop, “QuILT: Quantum Interactive Learning Tutorials,” Joint Meeting of North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

August 2005: Co-organizer and co-leader of the workshop, “Open Source Physics,” Summer Meeting of the American Association of Physics Teachers, Salt Lake City, Utah.

August 2005: Co-organizer and co-leader of 2, 8-hour workshops, “Developing Interactive Java-Based Pedagogy in the Classroom,” PTRA (Physics Teaching Resource Agents) Workshop, Salt Lake City, Utah. Also presented an additional 30-minute presentation on modern physics Physlet material.

March 2005: Co-leader and co-organizer of the professional development workshop, “Teaching Quantum Mechanics with Physlets and Open Source Physics,” Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

February 2005: Co-leader of the four-day workshop, “HTML, Physlets, and TIPERS,” one of the series of Physics Workshops for the 21<sup>st</sup> Century for two-year college and high school physics faculty, supported by the Division of Undergraduate Education through the Advanced Technological Education Program of the National Science Foundation, Joliet Junior College, Joliet, Illinois.

January 2005: Leader and organizer of the professional development workshop, “Physlets,” AP Physics Alliance Meeting, Center for Mathematics, Science, and Technology Education, University of North Carolina at Charlotte, Charlotte, North Carolina.

January 2005: Co-leader and co-organizer of the professional development workshop, “Teaching Quantum Mechanics with Physlets and Open Source Physics,” Winter Meeting of the American Association of Physics Teachers, Albuquerque, New Mexico.

October 2004: Co-leader and co-organizer of the professional development workshop, “Creating Physlet-Based Materials for an Interactive Classroom,” Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

October 2004: Co-leader and co-organizer of the professional development workshop, “Creating Physlet-Based Materials for an Interactive Classroom,” Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

October 2004: Leader and Organizer of the professional development workshop, “Creating Physlet-Based Materials for an Interactive Classroom,” Joint Meeting of the Michigan Section of the American Association of Physics Teachers and the Ohio Section of the American Physical Society, Auburn Hills, Michigan.

July 2004: Co-organizer and co-leader of the workshops, “Open Source Physics: Curriculum Development,” one of two three-day NSF-sponsored workshops, Eckerd College, St. Petersburg, Florida.

May 2004: Co-organizer and co-leader of the workshop, “Using and Adapting Physlet-Based Materials in the Classroom,” Teacher’s Day at the April Meeting of the American Physical Society, Denver, Colorado.

April 2004: Participant of the professional development workshops, “Teaching Through Touching,” “SCALE-UP,” “Just-in-Time Teaching,” and “Tutorials in Introductory Physics,” Invention and Impact: Building Excellence in Undergraduate STEM Education, a National Science Foundation Course, Curriculum, and Laboratory Improvement (NSF-CCLI) program conference, Arlington, Virginia.

April 2004: Organizer and leader of the workshop, “Creating Physlet-Based Materials for an Interactive Classroom,” Joint Meeting of the Texas Section of the American Physical Society and the Texas Section of the American Association of Physics Teachers, Stephenville, Texas.

January 2004: Co-organizer and co-leader of the workshop, “Using Digital Libraries to Find and Create Physlet-based Materials,” Winter Meeting of the American Association of Physics Teachers, Miami, Florida.

August 2003: Co-organizer and co-leader of the workshop, “Developing Interactive Java-Based Pedagogy in the Classroom,” Summer Meeting of the American Association of Physics Teachers, Madison, Wisconsin.

July 2003: Co-organizer and co-leader of 2, 8-hour workshops, “Developing Interactive Java-Based Pedagogy in the Classroom,” PTRA (Physics Teaching Resource Agents) Workshop, Madison, Wisconsin.

July 2003: Co-organizer and co-leader of the workshops, “Open Source Physics,” two three-day NSF-sponsored workshops, Davidson College, Davidson, North Carolina.

June 2003: Co-leader of the four-day workshop, “HTML, Physlets, and TIPERs,” one of the series of Physics Workshops for the 21<sup>st</sup> Century for two-year college and high school physics faculty, supported by the Division of Undergraduate Education through the Advanced Technological Education Program of the National Science Foundation, Joliet Junior College, Joliet, Illinois.

January 2003: Co-organizer and co-leader of the workshop, “Using Interactive Java-Based Pedagogy in the Classroom,” Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

August 2002: Co-organizer and co-leader of the workshop, “Developing Interactive Java-Based Pedagogy in the Classroom,” Summer Meeting of the American Association of Physics Teachers, Boise, Idaho.

July 2002: Co-organizer and co-leader of the workshop, “Teaching with Physlets,” workshop for Charlotte-Mecklenburg AP Physics teachers held at Davidson College, Davidson, North Carolina.

April 2002: Co-organizer and co-leader of the workshop, “Using Interactive Java-Based Pedagogy in the Classroom,” Spring Meeting of the Southern Atlantic Coast Section of the American Association of Physics Teachers, Gainesville, Georgia.

January 2002: Co-organizer and co-leader of the workshop, “Using Interactive Java-Based Pedagogy in the Classroom,” Winter Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

July 2001: Co-organizer and co-leader of the workshop, “Teaching with Physlets,” Summer Meeting of the American Association of Physics Teachers, Rochester, New York.

March 2001: Co-organizer and co-leader of the workshop, “Physlets” Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

November 2000: Organizer and co-leader of the workshop, “PASCO Workshop,” (workshop for high school teachers in the use of computers in the laboratory and the classroom), Davidson College Physics Department, Davidson, North Carolina.

November 2000: Participant of the workshop, “WebTOP,” Meeting of the Southeastern Section of the American Physical Society, Starkville, Mississippi.

August 2000: Co-organizer and co-leader of the workshop, “Teaching with Physlets,” Summer Meeting of the American Association of Physics Teachers, Guelph, Ontario, Canada.

June 2000: Leader and member of the organizing committee for the workshop, “Computer-Based Laboratories for Introductory Physics,” Summer Technology Workshop of the Associated Colleges of the South, Austin, Texas.

March 2000: Co-organizer and co-leader of the workshop, “Physlets” Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

January 2000: Co-organizer and co-leader of the workshop, “Problem Solving Using Interactive Web-Based Technologies,” Summer Meeting of the American Association of Physics Teachers, Kissimmee, Florida.

December 1999: Participant of the Teaching Effectiveness Workshop led by Bonnie McAlister, Davidson College, Davidson, North Carolina.

August 1999: Co-organizer and co-leader of the workshop, “Problem Solving Using Interactive Web-Based Technologies,” Summer Meeting of the American Association of Physics Teachers, San Antonio, Texas.

## **Conference Attendance**

March 2017: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Tarboro, North Carolina.

February 2018: Winter Meeting of the American Association of Physics Teachers, San Diego, CA.

October 2017: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pineville, North Carolina.

July 2017: Summer Meeting of the American Association of Physics Teachers, Cincinnati, OH.

March 2017: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

February 2017: Winter Meeting of the American Association of Physics Teachers, Atlanta, GA.

November 2016: PhysCon16, the 2016 Sigma Pi Sigma Quadrennial Congress, San Francisco, CA.

July 2016: Summer Meeting of the American Association of Physics Teachers, Sacramento, CA,

August 2016: PICUP Summer Faculty Development Workshop, Energize Undergraduate Physics Courses with Computation, River Falls, Wisconsin.

March 2016: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Elon, North Carolina.

January 2016: Winter Meeting of the American Association of Physics Teachers, New Orleans, LA.

October 2015: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

July 2015: Summer Meeting of the American Association of Physics Teachers, College Park, MD.

April 2015: PICUP Workshop: Computational Physics Across the Curriculum, Cleveland, OH.

April 2015: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Wake Forest, North Carolina.

January 2015: Winter Meeting of the American Association of Physics Teachers, San Diego, CA.

October 2014: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

October 2014: North Carolina Astronomers' Meeting, Greensboro, North Carolina.

July 2014: Summer Meeting of the American Association of Physics Teachers, Minneapolis, Minnesota.

April 2014: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Boone, North Carolina.

January 2014: Winter Meeting of the American Association of Physics Teachers, Orlando, Florida.

November 2013: Charlotte Regional NSTA Meeting, Charlotte, North Carolina.

October 2013: Joint Fall Meeting of the South Atlantic Coast and North Carolina Sections of the American Association of Physics Teachers, Greenville, South Carolina.

October 2013: North Carolina Astronomers' Meeting, Greensboro, North Carolina.

July 2013: Summer Meeting of the American Association of Physics Teachers, Portland, Oregon.

April 2013: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

January 2013: Winter Meeting of the American Association of Physics Teachers, New Orleans, Louisiana.

November 2012: 2012 Quadrennial Physics Congress (PhysCon), hosted by Sigma Pi Sigma, Orlando, Florida.



October 2012: North Carolina Astronomers' Meeting, Greensboro, North Carolina.

July 2012: Summer Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

June 2012: Gordon Research Conference on Physics Research and Education: Astronomy, Waterville, Maine.

March 2012: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Hickory, North Carolina.

January 2012: Winter Meeting of the American Association of Physics Teachers, Ontario, California.

November 2011: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Asheville, North Carolina.

September 2011: Joint MPTL-HSCI Meeting, University of Ljubljana, Slovenia.

August 2011: Summer Meeting of the American Association of Physics Teachers, Omaha, Nebraska.

July 2011: Using Astronomy to Teach Physics Workshop, Lincoln, Nebraska.

January 2011: Winter Meeting of the American Association of Physics Teachers, Jacksonville, Florida.

October 2010: Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

September 2010: National Society of Physics Students Council Meeting.

July 2010: Summer Meeting of the American Association of Physics Teachers, Portland, Oregon.

April 2010: Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Elon, North Carolina.

February 2010: Joint Winter Meeting of the American Association of Physics Teachers and American Physical Society, Washington, DC.

November 2009: Super Computing 2009 (SC09), Portland, Oregon.

October 2009: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

July 2009: Summer Meeting of the American Association of Physics Teachers, Ann Arbor, Michigan.

March 2009: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Hickory, North Carolina.

February 2009: Winter Meeting of the American Association of Physics Teachers, Chicago, Illinois.

November 2008: Super Computing 2008 (SC08), Austin, Texas.

November 2008: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

October 2008: NSTA Regional Meeting, Charlotte, North Carolina.

July 2008: Summer Meeting of the American Association of Physics Teachers, Edmonton, Alberta, Canada.

June 2008: Gordon Research Conference on Physics Research and Education: Computation and Computer-Based Instruction Bryant University, Smithfield, Rhode Island.

April 2008: Meeting of North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

January 2008: Winter Meeting of the American Association of Physics Teachers, Baltimore, Maryland.

October 2007: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, High Point, North Carolina.

July 2007: Summer Meeting of the American Association of Physics Teachers, Greensboro, North Carolina.

July 2007: AAPT Topical Conference: Computational Physics for Upper Level Courses Davidson College, Davidson, North Carolina.

March 2007: Meeting of North Carolina Section of the American Association of Physics Teachers, Greensboro, North Carolina.

January 2007: Joint Winter Meeting of the American Association of Physics Teachers and American Astronomical Society, Seattle, Washington.

September 2006: Joint Meeting of the North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Elon, North Carolina.

September 2006: Third International Conference on Hands-on Science, HSCI' 2006, Braga, Portugal.

July 2006: Summer Meeting of the American Association of Physics Teachers, Syracuse, New York.

June 2006: Gordon Research Conference on the Research and Teaching of Electromagnetism, Mt. Holyoke, Massachusetts.

March 2006: Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Belmont, North Carolina.

March 2006: March Meeting of the American Physical Society, Baltimore, Maryland.

January 2006: Winter Meeting of the American Association of Physics Teachers, Anchorage, Alaska.

November 2005: Joint Meeting of the Southeastern Section of the American Physical Society and the Florida Section of the American Association of Physics Teachers, Gainesville, Florida.

October 2005: Fall Meeting of North Carolina Section of the American Association of Physics Teachers, Pembroke, North Carolina.

October 2005: 10th Workshop on Multimedia in Physics Teaching and Learning of the European Physical Society, Berlin, Germany.

August 2005: Summer Meeting of the American Association of Physics Teachers, Salt Lake City, Utah.

March 2005: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

January 2005: Winter Meeting of the American Association of Physics Teachers, Albuquerque, NM.

October 2004: Joint Meeting of North Carolina Section of the American Association of Physics Teachers and Zone 9 of the Society of Physics Students, Davidson, North Carolina.

October 2004: Joint Meeting of the Michigan Section of the American Association of Physics Teachers and the Ohio Section of the American Physical Society, Auburn Hills, Michigan.

August 2004: Summer Meeting of the American Association of Physics Teachers, Sacramento, California.

May 2004: April Meeting of the American Physical Society, Denver, Colorado.

April 2004: Invention and Impact: Building Excellence in Undergraduate STEM Education, a National Science Foundation Course, Curriculum, and Laboratory Improvement (NSF-CCLI) program conference, Arlington, Virginia.

April 2004: Joint Meeting of the Texas Section of the American Physical Society and the Texas Section of the American Association of Physics Teachers, Stephenville, Texas.

March 2004: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

January 2004: Winter Meeting of the American Association of Physics Teachers, Miami, Florida.

November 2003: Joint Meeting of the Southeastern Section of the American Physical Society and the North Carolina Section of the American Association of Physics Teachers, Wilmington, North Carolina.

August 2003: Summer Meeting of the American Association of Physics Teachers, Madison, Wisconsin.

April 2003: Joint Meeting of the American Physical Society and the Division of Particles and Fields, Philadelphia, Pennsylvania.

March 2003: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Greensboro, North Carolina.

January 2003: Winter Meeting of the American Association of Physics Teachers, Austin, Texas.

November 2002: Joint Fall Meeting of the North Carolina and Southern Atlantic Coast Sections of the American Association of Physics Teachers, Asheville, North Carolina.

September 2002: MERLOT International Conference, Atlanta, Georgia.

September 2002: 7th Workshop on Multimedia in Physics Teaching and Learning, Parma, Italy.

September 2002: CoLoS Meeting, Paris, France.

August 2002: Summer Meeting of the American Association of Physics Teachers, Boise, Idaho.

June 2002: Gordon Research Conference on Physics Research and Education: Quantum Mechanics, South Hadley, Massachusetts.

April 2002: Spring Meeting of the Southern Atlantic Coast Section of the American Association of Physics Teachers, Gainesville, Georgia.

March 2002: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Winston Salem, North Carolina.

February 2002: Invitational Conference on K-12 Outreach from University Science Departments: Using Technology to Link the Classroom to the Laboratory (and Murphy to Manteo), Raleigh, North Carolina.

January 2002: Winter Meeting of the American Association of Physics Teachers, Philadelphia, Pennsylvania.

November 2001: Meeting of the Southeastern Section of the American Physical Society, Charlottesville, Virginia.

July 2001: Summer Meeting of the American Association of Physics Teachers, Rochester, New York.

March 2001: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Raleigh, North Carolina.

March 2001: Charlotte Optical Society of America Chapter Meeting, Davidson, North Carolina.

November 2000: Meeting of the Southeastern Section of the American Physical Society, Starkville, Mississippi.

October 2000: Joint Fall Meeting of the South Atlantic and North Carolina Sections of the American Association of Physics Teachers, Spartanburg, South Carolina.

August 2000: Summer Meeting of the American Association of Physics Teachers, Guelph, Ontario, Canada.

April 2000: Joint Spring Meeting of the New England Section of the American Physical Society and the American Association of Physics Teachers, Providence, Rhode Island.

March 2000: Spring Meeting of the North Carolina Section of the American Association of Physics Teachers, Davidson, North Carolina.

January 2000: Winter Meeting of the American Association of Physics Teachers, Kissimmee, Florida.

November 1999: Meeting of the Southeastern Section of the American Physical Society, Chapel Hill, North Carolina.

October 1999: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Boone, North Carolina.

August 1999: Summer Meeting of the American Association of Physics Teachers, San Antonio, Texas.

1999: Fall Meeting of the North Carolina Section of the American Association of Physics Teachers, Winston-Salem, North Carolina.

1999: Centennial Meeting of the American Physical Society, Atlanta, Georgia.

1998: North Carolina Section of the American Association of Physics Teachers, Asheville, North Carolina.

1996: First International School and Sixth International Workshop on Light-Front Quantization and Non-Perturbative QCD, Ames, Iowa.

1995: Fifth International Workshop on Light-Front Quantization and Non-Perturbative QCD, Telluride, Colorado.

1994: Fourth International Workshop on Light-Front Quantization and Non-Perturbative QCD, Seattle Washington.

1992: Second International Workshop on Light-Front Quantization and Non-Perturbative QCD, Telluride, Colorado.

1988: Meeting of the Division of Particles and Fields of the American Physical Society, Storrs, Connecticut.

### **Professional Societies**

American Physical Society

Southeastern Section of the American Physical Society

American Association of Physics Teachers

North Carolina Section of the American Association of Physics Teachers

Society of Physics Students

Sigma Pi Sigma

### **Computer Experience**

I have worked extensively with Windows (NT, 2000, XP, Vista, 7, 8, and 10) and Macintosh personal computers. I am fluent in JavaScript, HTML, XHTML, MathML, and LaTeX. I use Mathematica, Excel, and PowerPoint software in the laboratory and lecture.