

WENDY K. ADAMS

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EDUCATION

- Ph.D., Physics**, University of Colorado, Boulder, Colorado, 2008
Physics Education Research under the direction of Distinguished Professor Carl Wieman.
- M.S., Physics**, University of Colorado, Boulder, Colorado, 1996
Atomic, Molecular and Optical Physics under the direction of Professors' John Cooper and Allan Gallagher
- B.A., Physics, Minor Mathematics *Summa Cum Laude***, University of Northern Colorado, 1994

CURRENT POSITION

- Director**, Science Education Programs, 2014 – Present
University of Northern Colorado.
- Associate Professor**, Department of Physics and Astronomy, 2013 – Present
(Assistant Professor 2011 – 2013)
- Graduate Faculty**, Graduate School and International Admissions, 2012 – Present
- Teacher Education Faculty**, College of Education and Behavioral Sciences, 2011 – Present

CURRENT MAJOR SERVICE POSITIONS

- Chair**, Committee on Teacher Preparation, American Association of Physics Teachers
- Member**, Editorial Board, The Physics Teacher
- APS-AAPT Member**, Executive Committee of the American Physical Society's Forum on Education (FEEd) 2014 – 2017
- Vice Chair**, Excellence in Physics Education Award selection Committee, American Physical Society
- Vice President**, American Association of Physics Teachers CO/WY Section

See below for complete listing of Professional Service

GRANTS

Pending

Callan, Moroye, Falconer, Reinsvold, (**Adams Sr. Personnel**): **Colorado School of Mines and University of Northern Colorado's Noyce Scholarship Program (CO-STEM NSP)**, Noyce Scholarship Grant, UNC Side: \$218,987. (total budget \$1,196,046)
2016 - 2021

Adams, PhysTEC: Solving the Physics Teacher Shortage, NSF Unsolicited Proposal \$92,266.
Sub Award with APS (total budget \$7,900,000)
2016 – 2021

Active

Adams: Perceptions of Teaching as a Profession. UNC Assessment Mini-Grant \$1,500
2015 - 2016

Adams, Moroye, Kuo, Callan, DeCaluwe: Collaborative Physics Teacher Preparation at University of Northern Colorado and the Colorado School of Mines. PhysTEC Comprehensive Site \$319,504
2015 - 2018

Adams & Straw: Elementary Science Education Program Assessment. UNC Assessment Leadership Institute. \$2,500.
2014 - 2016

Adams & Schwenz: Secondary Science Education Program Assessment. UNC Assessment Leadership Institute \$2,500.
2014 - 2016

Reinsvold, **Adams**, Moroye: NSF NOYCE Capacity Building Project: **Collaborative Research: An Engineering University Partnering with a Teacher Preparation University to Produce Highly Qualified Secondary STEM Teachers.** UNC Side: \$207,557
2014 – 2016

See below for listing of past grants

RECENT UNIVERSITY SERVICE HILIGHTS

- | | |
|---|-------------------------|
| Walking Mountains Science Center | Fall 2015 |
| WMSC approached UNC in September to discuss a possible path to a Masters degree for their interns. I have worked with WMSC to modify the Science Education MA degree program, add two new courses to our graduate catalog, and evaluated and appointed a few of their faculty as UNC Graduate Faculty Equivalents. The first WMSC intern begins at UNC in January. | |
| New elementary science curriculum and track | August – September 2015 |
| Due to pressure from the College of Education the elementary core science curriculum required substantial credit reduction as well as compression of our four science emphasis areas to just one track. I led the development of seven new courses and their alignment with six different sets of standards and shepherded these through four separate curriculum committees. | |
| Colorado School of Mines Teaching program | Fall 2013 - Present |
| Initiated contact with colleagues at Mines and have worked closely with and pushed hard to advance this new program to prepare science and math teachers from Mines. | |

RECENT COMMUNITY SERVICE HILIGHTS

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|---|----------------|
| Development of the Creative Elementary Science Teaching Awards | 2015 – Present |
| Working with Dick Bond to develop four awards to recognize and encourage elementary teachers who have provided experiences to their students to help them learn how to think logically, to make decisions based on evidence and to ask questions. | |
| Double Physics Demo Show, University High School Chemistry Students | 2015 |
| Physics Demo Show, CO/WY Academy of Science | 2015 |

PROFESSIONAL HONORS / AWARDS

- | | |
|--|------|
| The Outstanding Achievement Award by UNC Sponsored Programs | 2015 |
| Most cited Physical Review Special Topics – Physics Education Research Article | 2015 |
| 100Kin10 Partner, Mines – UNC STEM Teacher Preparation Program | 2015 |
| Tech Award Laureate, The Tech Museum. For PhET Interactive Simulations. | 2011 |

PUBLICATIONS

In Review

1. Wieman, E. E. and **Adams, W. K.**, Comment on “Evaluation of Colorado Learning Attitudes about Science Survey” by Douglas et al, *Physical Review Special Topics – Physics Education Research*, (in review)
2. Armstrong, Z. B., Galovich, C. and **Adams, W. K.**, Determining the Effectiveness of PhET Interactive Simulations as Homework. *Physical Review Special Topics – Physics Education Research* (in review)
3. Dunn, A., Jordan, C. and **Adams, W. K.**, Force Vectors and a Snickers Bar, *The Physics Teacher* (in review)
4. **Adams, W. K.** and Wieman, C. E., Effortful practice in learning physics--better learning by blocking shortcuts *The Physics Teacher* (in review)
5. Jordan, C., Dunn A. and **Adams, W. K.**, Motion in Two Dimensions: Projectile Motion, *The Physics Teacher* (in review)

Peer-Reviewed

6. **Adams, W. K.**, Armstrong, Z. B. and Galovich, C. (2016). Scaffolding PhET simulations for student engagement in and out of the classroom. *Physics Education Research Conference 2015 Proceedings*.(in press)
7. **Adams W. K.** and Willis, C. Sparking Curiosity: How do you know what your students are thinking? (2015). “Art, Craft and Science of Physics Teaching” Special Collection in *The Physics Teacher*, 53(8), 469-472.
8. Callan, K. and **Adams W. K.** (2015). A Symbiotic Physics Teacher Preparation Partnership, *APS Forum on Education Newsletter*, Summer 2015 (Invited)
9. **Adams, W. K.** and Wieman, C.E. (2015). Analyzing the many skills involved in solving complex physics problems, *American Journal of Physics*, 83(5), 459-467.
10. Wieman, C. E., **Adams, W. K.** and Perkins, K. K. (2014). Educational simulations that enhance motivation, engagement, and learning, *China Physics*, 43(6), 409-413. (Invited)
11. Day, J., **Adams, W.**, Wieman, C. E., Schwartz, D. L. and Bonn, D. A. (2014). Invention Activities: A Path to Expertise, *Physics In Canada*, 70(2), 81 – 83.
12. **Adams, W. K.**, Clark, A. and Schneider, K. Classroom Materials from the Acoustical Society of America. *The Physics Teacher*, 2013, 51(7), 348 - 350.
13. **Adams, W. K.**, Alhadlaq, H., Malley, C., Perkins, K. K., Olson, J., Alshaya, F., Alabdulkareem, S., and Wieman, C. E., Making science simulations and websites easily translatable and available worldwide: Challenges and solutions. *Journal of Science Education and Technology*, 2012, 21, 1, 1-10.
14. **Adams, W. K.** and Wieman. C.E. Development and validation of instruments to measure learning of expert-like thinking. *International Journal of Science Education*, 2011, 33, 9, 1289-1312.
15. Yu, B. and Adams, W. K., Scenario based think aloud protocol for probing student problem solving skills. *2010 STEM in Education Conference Proceedings*, 2011.

16. Podolefsky, N. S., **Adams, W. K.**, Lancaster, K. and Perkins, K. K. Characterizing complexity of computer simulations and implications for student learning. *Physics Education Research Conference Proceedings* 2010.
17. Podolefsky, N. S., Perkins, K. K., **Adams, W. K.** (2010), Factors Promoting Engaged Exploration with Computer Simulations. *Physical Review Special Topics – Physics Education Research* 6(2), 020117.
18. **Adams, W. K.**, Alhadlaq, H., Malley, C., Perkins, K. K., Olson, J., Alshaya, F., Alabdulkareem, S., and Wieman, C. E. Making on-line science course materials easily translatable and accessible worldwide: challenges and solutions. *Multimedia in Physics Teaching and Learning Proceedings*, 14, 2010, 113-120.
19. **Adams, W. K.** Student engagement and learning with PhET Interactive Simulations. *Invited Multimedia in Physics Teaching and Learning Proceedings*, 14, 2010, 21-32.
20. Alhadlaq, H., Alshaya, F., Alabdulkareem, S., Perkins, K. K., **Adams, W. K.**, and Wieman, C.E. (2009) Measuring student's beliefs about physics in Saudi Arabia *2009 Physics Education Research Conference Proceedings*, 69-72.
21. Podolefsky, N. S., Perkins, K. K., and **Adams, W. K.** (2009). Computer simulations to classrooms: Tools for change. *2009 Physics Education Research Conference Proceedings*, 233-236.
22. Podolefsky, N. S., **Adams, W. K.**, and Wieman, C. E. (2009). Student Choices when Learning with Computer Simulations. *2009 Physics Education Research Conference Proceedings*, 229-232.
23. Wieman, C. E., **Adams, W. K.**, Loeblein, T. and Perkins, K. K. (2010). Teaching physics using PhET Simulations. *The Physics Teacher*, 48(4), 225-227.
24. Smith, M. K., Wood, W. B., **Adams, W. K.**, Wieman, C., Knight, J. K., Guild, N. and Su, T. T. (2009). Why peer discussion improves student performance on in-class concept questions. *Science*, 323(5910), 122-124.
25. **Adams, W. K.**, Paulson, A. and Wieman, C. E. (2009). What Levels of Guidance Promote Engaged Exploration with Interactive Simulations? *2008 Physics Education Research Conference Proceedings*, 59-63.
26. Wieman, C. E., **Adams, W.K.**, Perkins, K.K. (2008). PhET: Simulations that enhance learning. *Science*, 322(5902), 682-683.
27. Gray, K. E., **Adams, W. K.**, Perkins, K. K., and Wieman, C. E. (2008). Students know what physicists believe, but they don't agree: A study using the CLASS survey, *Physical Review: Special Topics Physics Education Research*, 4(2), 020106.
28. **Adams, W. K.**, Reid, S., LeMaster, R., McKagan, S. B., Perkins, K. K., Dubson, M. and Wieman, C. E. (2008). A Study of Educational Simulations Part I - Engagement and Learning. *Journal of Interactive Learning Research*, 19(3), 397-419.
29. **Adams, W. K.**, Reid, S., LeMaster, R., McKagan, S. B., Perkins, K. K., Dubson, M. and Wieman, C. E. (2008). A Study of Educational Simulations Part II - Interface Design. *Journal of Interactive Learning Research*, 19(4), 551-557.
30. Barbera, J., **Adams, W. K.**, Wieman, C. E. and Perkins, K. K. (2008). Modifying and validating the Colorado Learning Attitudes about Science Survey for use in chemistry, *Journal of Chemical Education*, 85(10), 1435-1439.
31. Wieman, C. E., Perkins, K. K. and **Adams, W. K.** (2008). Oersted Medal Lecture 2007: Interactive simulations for teaching physics: What works, what doesn't and why. *American Journal of Physics*, 76(4), 393-399.

32. **Adams, W. K.** and Wieman, C. E. (2007). Problem solving skill evaluation instrument – Validation studies. *2006 Physics Education Research Conference Proceedings*, 883, 18-21. (Invited)
33. Perkins, K., Barbera, J., **Adams, W.K.**, and Wieman, C. E. (2007) Chemistry vs. physics: A comparison of how biology majors view each discipline, *2006 Physics Education Research Conference Proceedings*, 883, 53-57.
34. Finkelstein, N.D., **Adams, W.**, Keller, C., Perkins, K., Wieman, C. and the PhET Team (2006). High-Tech tools for teaching physics: the Physics Education Technology Project, *Journal of Online Teaching and Learning*, 2(3).
35. **Adams, W. K.**, Perkins, K. K., Dubson, M., Finkelstein, N.D. and Wieman, C.E. (2006). A new instrument for measuring student beliefs about physics and learning physics: The Colorado Learning Attitudes about Science Survey, *Physical Review, Special Topics - Physics Education Research*, 2(1), 010101.
36. Perkins, K. K., **Adams, W.**, Finkelstein, N. D., Dubson, M., LeMaster, R., Reid, S. and Wieman, C.E. (2006). PhET: Interactive simulations for teaching and learning physics. *The Physics Teacher*, 44.
37. Finkelstein, N. D., **Adams, W. K.**, Keller, C. J., Kohl, P. B., Perkins, K. K., Podolefsky, N. S., Reid, S. and LeMaster, R. (2005). When learning about the real world is better done virtually: A study of substituting computer simulations for laboratory equipment, *Physical Review, Special Topics - Physics Education Research*, 1(1), 010103.
38. Perkins, K. K., Gratny, M.M., **Adams, W.K.**, Finkelstein, N. D., and Wieman, C.E. (2006). Towards characterizing the relationship between students' interest in and their beliefs about physics, *2005 Physics Education Research Conference Proceedings*, 818, 137-140.
39. **Adams, W. K.**, Perkins, K. K., Dubson, M., Finkelstein, N.D. and Wieman, C.E. (2005). The design and validation of the Colorado Learning Attitudes about Science Survey. In *AIP Conference Proceedings* (Vol. 790, p. 45). IOP Institute of Physics Publishing LTD.
40. Perkins, K., **Adams, W.**, Finkelstein, N. and Wieman, C. (2005). Correlating student beliefs with student learning using the Colorado Learning Attitudes about Science Survey. In *AIP Conference Proceedings* (Vol. 790, p. 61). IOP Institute of Physics Publishing LTD.
41. Finkelstein, N. D., Perkins, K. P., **Adams, W.**, Kohl, P., and Podolefsky, N. (2005). Can Computer Simulations Replace Real Equipment in Undergraduate Laboratories?. In *AIP Conference Proceedings* (Vol. 790, p. 101)

RECENT INVITED PRESENTATIONS

Adams, W. K., The Many Skills Used to Solve Complex Problems, *American Association of Physics Teachers 2016 Summer Meeting, Sacramento, CA.*

Adams, W. K., Recruiting Engineering Students to be Physics Teachers – Panel, *PhysTEC Annual Conference, 2016, Baltimore, MD.*

Adams, W. K., Interactive Workshop of Perceptions of Teaching, *PhysTEC Annual Conference, 2016, Baltimore, MD.*

Adams, W. K., Panel: Electronic Physics Education Resources for Teachers and Teacher Educators, *American Association of Physics Teachers 2016 Winter Meeting, New Orleans, LA.*

Adams, W. K., Sparking Curiosity: Motivating Student Learning, *Physics Department Colloquium, Colorado School of Mines, Golden, CO. 2015*

Adams, W. K., Plantt, T., Larson, A. N., Hoots, L., Drennan, A., 30 Demos in 60 Minutes – Elementary and Middle School, *National Science Teachers Association 2015 Regional Meeting, Kansas City, MO.*

Adams, W. K., Plantt, T., Larson, A. N., Hoots, L., Drennan, A , 30 Demos in 60 Minutes – High School, *National Science Teachers Association 2015 Regional Meeting, Kansas City, MO.*

Adams, W. K., Armstrong, Z. & Galovich, C., Can students learn from simulations at home, alone?, *Physics Education Research Conference, Baltimore, MD.*

Adams, W. K., Perceptions of Teaching as a Profession: Survey Development, *PhysTEC Site Leader Meeting, 2015, Baltimore, MD.*

Adams, W. K., Sparking Curiosity; Motivating Student Learning, *University of Northern Colorado Discipline Based Education Research Seminar, Greeley, CO.*

Adams, W. K., Sparking Curiosity: Motivating Student Learning, *Stanford AAALab Research Presentation, 2014, Stanford, CA.*

Adams, W. K., STEM Teacher Preparation Challenges: Higher education perspective, *Colorado STEM Teacher Preparation Symposium, 2014, Longmont, CO.*

Adams, W. K., Sparking Curiosity; How to Motivate Students to Learn, *Physics Department Colloquium, 2014, Colorado State University, Fort Collins, CO.*

Adams, W. K., Assessing an AP Physics B MOOC, *Physics Education Research Group, Massachusetts Institute of Technology, 2014, Boston, MA.*

Adams, W. K., Fun and Engaging Problem Solving Labs, *Physics Department Seminar, Air Force Academy, 2014, Colorado Springs, CO.*

Adams, W. K., Research-based assessment instruments: Design, validation and interpretation *American Physical Society March Meeting, 2014, Denver, CO.*

Adams, W. K., Acoustical Society of America, *Society of Physics Students Spring 2014 Zone 14 Meeting, Golden, CO.*

Adams, W. K., Alternative Approaches to Assessment *UNC 2014 Assessment Luncheon, Greeley, CO.*
See below for 2005 – 2013 invited presentations

RECENT WORKSHOPS PRESENTED

Adams, W. K. & Merrell, D., Fun and Engaging Labs, *American Association of Physics Teachers 2016 Summer Meeting, Sacramento, CA*

Adams, W. K., Interactive Workshop on the Teaching Practices Survey, *PhysTEC Annual Conference, 2016, Baltimore, Maryland.*

Adams, W. K. & Merrell, D, Fun and Engaging Labs, *American Association of Physics Teachers 2016 Winter Meeting, New Orleans, LA*

Callan, K. K. & Adams, W. K. A win-win partnership: A science and engineering university with a teacher preparation institution, *100Kin10 Annual Conference, Chicago, Illinois. May, 2015*

Adams, W. K. Mass, Weight, Volume and Density, *MAST-EL Professional Development, Dunn Elementary School, Ft. Collins, CO. April, 2015*

Adams, W. K., Sparking Curiosity, Motivating Student Learning, *2015 Colorado/Wyoming Sectional meeting of the American Association of Physics Teachers.*

Adams, W. K. & Merrell, D., Fun and Engaging Labs, *American Association of Physics Teachers 2015 Winter Meeting, San Diego, CA*

See below for 2006 – 2013 workshops presented

TEACHING

Curriculum Developed:

University of Northern Colorado

Elementary Science Curriculum , 2015

Developed Science 225: Writing on Scientific Practices, Science 266: Earth and Life Science Concepts, Science 365: Advanced Physical Science Concepts, Science 465: Principles of Scientific and Engineering Practices, Science Education 381: Science Teaching Assistant

Elementary Science Track, 2015

Created a 12 credit track in science with courses tailored to the elementary teacher candidate and with equal representation from each discipline area: Biology, Chemistry, Earth Science and Physics.

Walking Mountain Science Center Masters in Science Education, 2015

Integrated two new courses into the existing Science Education MA: Science Education 551: History and Theory of Environmental Education; and, Science Education 553: Program Design and Planning in Environmental Education

Science Education Masters Program Redesign, 2014

Based on a new design recommended by the science unit leaders, modified the program design and eight syllabi to update the program in the Graduate Catalog.

Acoustical Society of America

Hands-on, minds-on sound curriculum developed for different grade levels from K-16. In total 52 lessons and four assessments were created, tested in the classroom and reviewed by experts and teachers.

Courses Developed:

University of Northern Colorado

Science Education 678: **Science Education Seminar**

2015, Developed an online, 2 credit version of this seminar course specifically for practicing science teachers, both secondary and elementary. Created assignments that utilize the Blog tool and Blackboard Collaborate so that students are interacting both via the blog and a weekly synchronous e-Meet video discussion.

Science Education 622: **Research-based Physics Teaching Methodology**

2013, Observation of and participation in “Methods for Teaching Secondary School Science”, supplemented with readings from professional literature on effective teaching methodologies in physics and math as well as literature from cognitive science on how students learn.

Science Education 622: **Evolution of Physics Teacher Professional Practice**

2013, Review of professional literature on the evolution of professional practice and teacher preparation. Ideas will be applied to observation of a student teacher including extensive field notes and comparison of the student teacher’s growth with typical progressions reported in the literature.

Science Education 441: **Methods for Teaching Secondary School Science**

2013, Redesigned the objectives of this course in cooperation with the other instructor to better align the course with research based teaching practices.

Science 465: **Principles of Scientific & Engineering Practices** – Pre-Service Elementary Teachers

2010 -2012 This course is an update of “Principles of Scientific Inquiry – Finding Order in Chaos” The new course has a strong focus on understanding science as a way of knowing and comparing science and engineering practices. It includes many activities that directly translate to the elementary classroom.

Science 265: **Physical Science Concepts** for Elementary Teachers Course and Laboratory
2014, Refocused the course to become a deep look at the fundamentals of physical science.
Course is now aligned with Colorado Academic Standards and Next Generation Science
Standards. Labs are active and engaging with most directly translatable to the elementary
classroom. Instruction now uses research based teaching strategies. Received a \$20,000
PhysTEC grant to train other science faculty to teach the course with these strategies.

Physics 220 & 221: **Introductory Physics I & II** - algebra based Courses and Laboratories
2012, Designed course to use Research based teaching strategies including Just in Time
Teaching, Peer Instruction, and various engaging group activities. All labs developed to engage
students in sense making, offer choice by the students and between group challenges.

Science 103: **Physical Science for the 21st Century**
2003, This is a 3 credit course without lab. Created a curriculum that utilized hands on
experiments during every class meeting.

Courses Delivered

University of Northern Colorado, Greeley, Colorado

Science 103: Physical Science for the 21st Century

Science 106: Introduction to Space Flight

Science 265: Physical Science Concepts for Elementary Teachers Course and laboratory

Science 465: Principles of Scientific & Engineering Practices – Pre-Service Elementary Teachers

Science Education 441/541: Methods of Teaching Secondary School Science

Science Education 622: Teaching Methods

Science Education 622: Evolution of Science Teaching Practices

Science Education 695: Action Research I

Science Education 696: Action Research II

Science Education 697: Action Research III

Science Education 678: Science Education Seminar

Physics 220: Introductory Physics I - algebra based Course and Laboratory

Physics 221: Introductory Physics II - algebra based Course and Laboratory

Physics 240: General Physics I Laboratory

Physics 241: General Physics II Laboratory

Help session Physics 240: General Physics I – calculus based

University of Colorado, Boulder, Colorado, Department of Physics

Physics 2020: Introductory Physics 1, Laboratory/Recitation

Physics 2021: Introductory Physics 2, Laboratory/Recitation

STUDENTS MENTORED

Postdoctoral Advisor:

2007 – 2009, Archie Paulson, PhET Interactive Simulations - Physics

2008 – 2010, Noah Podolefsky, PhET Interactive Simulations – Physics

2009 – 2010, Kelly Lancaster, PhET Interactive Simulations - Chemistry

PhD. Students:

2013 - Present, Jeffrey King, Math, Faculty Representative

2014 - Present, Brent Hancock, Math, Faculty Representative

2015 - Present, Marki Dittman, Math, Faculty Representative

Master's Students:

2015 – Present, Laura Trevena-Funk, committee member

2015 – Present, Brianne Nelms, Advisor

2014 – Present, Kimberly Finn, Advisor

2014 – Present, Adrienne Nicole Larson, Physical Science Curriculum Development (AAPT poster presentation, UNC Assessment Fair presentation and NSTA presentation)

2013 - 2014, Kristine Bibbey, Dean's Citation for Excellence, The Effect of Computer Simulations on Learning High School Physics, Advisor

2011 - 2012, Zachary Armstrong, Determining the Effectiveness of PhET Simulations as Homework, co-advisor (PRST & PERC papers, AAPT poster presentation, PERC invited poster)

2012 - 2013, Paul Schwartz, Examining the item functioning of the Chemistry Concepts Inventory, committee member

2010, David Patrick, Chemistry Education Research, committee member

Undergraduate Students:

2014 – Present, Taylor Plantt, Teaching Practices Survey and impact of elementary physics curriculum (PhysTEC presentations, AAPT poster presentation, NSTA presentation)

2013 – 2014 Connor Jordan, Force Concept Inventory and Reducing the Gender Gap in College Physics (Two Physics Teacher papers and four poster presentations)

2013 - 2014 Amy Dunn, Fun and Engaging Problem Solving Labs (Two Physics Teacher Papers)

2012 - 2013 Cody VanDoren, Force Concept Inventory validation interviews (AAPT poster presentation)

2012, Aaron Adamson, UNC Secondary Teaching Physics Emphasis

2011 - 2012, Kelseigh Schneider, Development and Review of Acoustics Physical Science Curriculum (Physics Teacher paper and Explore Sound curriculum)

2012, Isabel Kirk, Force Concept Inventory validation interviews

OTHER PUBLICATIONS

Online

Reinsvold, L. A., Reinsvold, R. J., Cleveland, L. M., **Adams, W. K.** & Keenan, S. M. Report of the 2013 Colorado STEM Teacher Preparation Symposium. *University of Northern Colorado*
http://mast.unco.edu/TeacherDevelopment/STEMTeacherPrep/UNC_ColoradoSTEMTeachPrepReport_2014.pdf

Adams, W. K. Fun and Engaging Problem Solving Labs,
<http://www.unco.edu/nhs/physics/faculty/adams/Research/Labs/Introductory%20Physics%20Labs.htm>, 2014

Includes 26 labs for the two term sequence of introductory physics for science majors.

Adams, W. K. Acoustics Lesson plans for Elementary, Physical Science and Introductory Physics edited by American Association of Physics Teachers Physics Teacher Resource Agents and Acoustical Society of America Activity Kit for Teachers Committee *Explore Sound Website*
www.exploresound.org, 2013

Includes 52 full lesson plans and four assessments that have been tested in the classroom and reviewed by teachers and experts.

Adams, W. K. and Schneider, K. Acoustics Lesson plans for Lower Elementary edited by American Association of Physics Teachers Physics Teacher Resource Agents and Acoustical Society of America Activity Kit for Teachers Committee, USB Thumb drive in the Activity Kit for Teachers

Includes seven full lesson plans and one assessment that have been modified from upper elementary plans that were tested in the classroom and reviewed by teachers and experts. 2012

Adams, W. K. Acoustics Lesson plans for Introductory Physics edited by American Association of Physics Teachers Physics Teacher Resource Agents and Acoustical Society of America Activity Kit for Teachers Committee, USB Thumb drive in the Activity Kit for Teachers. 2012

Includes 14 full lesson plans, seven laboratory exercises and two assessments that have been tested in the classroom and reviewed by teachers and experts.

Adams, W. K. Acoustics Lesson plans for Physical Science edited by American Association of Physics Teachers Physics Teacher Resource Agents and Acoustical Society of America Activity Kit for Teachers Committee, USB Thumb drive in the Activity Kit for Teachers. 2012.

Includes 23 full lesson plans and three assessments that have been tested in the classroom and reviewed by teachers and experts.

Adams, W. K., Wieman, C. E. & Schwartz, D. Teaching Expert Thinking, CW-SEI Instructor Resources, http://www.cwsei.ubc.ca/resources/instructor_guidance.htm, 2008

Book Chapters

Adams, W. K. Tuning Fork Discovery in Progressive Science initiative 8th grade science unit by Bill Chestnut. New Jersey Center for Teaching and Learning; New Jersey. 2013

Conference Abstracts

2016, **Adams, W.K.**, Reitz, B., Easter, G. & Lincoln, J., 30 Demos in 60 minutes, *American Association of Physics Teachers 2016 Winter Meeting, New Orleans, LA.*

2015, **Adams, W. K.**, Larson, A. N and Plantt, T. Physics for elementary teachers; student framed v. traditional approach, *American Association of Physics Teachers 2015 Summer Meeting, Baltimore, MD.*

2015, **Adams, W. K.** Make and Take, *American Association of Physics Teachers 2015 Summer Meeting, Baltimore, MD.*

2015, **Adams, W. K.** & Larson, A. N. Elementary Teacher candidates personal interest in physics, *UNC Assessment Fair, Greeley, CO.*

2015, **Adams, W.K.** Elementary teacher candidate's personal interest in physics, *American Association of Physics Teachers 2015 Winter Meeting, San Diego, CA.*

2015, **Adams, W.K.**, Willis, C., Merrell, D., 30 Demos in 60 minutes, *American Association of Physics Teachers 2015 Winter Meeting, San Diego, CA*

2014, Reinsvold, R. J., Greivel, G., **Adams, W. K.**, Falconer, R. & Moroye, C. CO-STEM The new Collaborative STEM Teacher Preparation Program between University of Northern Colorado and Colorado School of Mines, *Colorado STEM Teacher Preparation Symposium, Longmont, CO.*

2014, Reinsvold, L. A., Keenan, S. M., Reinsvold, R. J. Cleveland, L. M. and **Adams, W. K.** Colorado STEM Teacher Preparation Symposium – A State Collaboration Association of American Colleges & Universities *2014 Transforming STEM Higher Education, Atlanta, GA.*

2014, **Adams, W. K.**, If They Make it, They Will Learn: Sound and Music on the Cheap! *American Association of Physics Teachers 2014 Summer Meeting, Minneapolis, MN.*

2014, **Adams, W. K.**, Diverse Environments in Northern Colorado K-12 Schools *American Association of Physics Teachers 2014 Summer Meeting, Minneapolis, MN.*

2014, Semak, M. R., **Adams, W.K.** and Dietz, R. D., Force Concept Inventory Clarifications *American Association of Physics Teachers 2014 Summer Meeting, Minneapolis, MN.*

2014, **Adams, W.K.** and Jordan, C. Solving the Two Sigma Problem *American Association of Physics Teachers 2014 Summer Meeting, Minneapolis, MN.*

2014, **Adams, W. K.** and Jordan, C. The Gender Gap in College Physics *UNC 2014 Assessment Fair, Greeley, CO.*

2014, **Adams, W. K.**, Jordan, C, Dietz, R. D. and Semak, M.R., Reducing the gender Gap in College Physics *American Association of Physics Teachers 2014 Winter Meeting, Orlando, FL.*

2014, Semak, M. R., Dietz, R. D., **Adams W. K.**, Jordan, C., Clarifying the FCI via Think-aloud Interviews *American Association of Physics Teachers 2014 Winter Meeting, Orlando, FL.*

2013, **Adams, W. K.** 30 Demos in 50 Minutes *National Science Teachers Association Regional Conference, Denver, CO.*

2013, **Adams, W. K.**, Dietz, R. D. and Semak, M. R. Listening to Students: How We Investigate the FCI *Physics Education Research Conference 2013, Portland, OR.*

2013, **Adams, W. K.**, Dietz, R. D. and Semak, M. R. Exploring Student Reactions to a Modified Force concept Inventory *American Association of Physics Teachers 2013 Summer Meeting, Portland, OR.*

2013, **Adams, W. K.**, Productive and FUN use of lab time! *American Association of Physics Teachers CO/WY Meeting, Denver, CO.*

2013, **Adams, W. K.**, Generalizing Musical Instruments *American Association of Physics Teachers 2013 Winter Meeting, New Orleans, LA.*

2013, **Adams, W. K.**, Dietz, R. D., Semak, M. R., Willis, C. W. Consequences of Attempted Clarifications of Force Concept Inventory Questions *American Association of Physics Teachers 2013 Winter Meeting, New Orleans, LA.*

2012, Reinsvold, R. Reinsvold, L., **Adams W.**, Galovich, C. and Sexton, J. Preparing the Next Generation of Science Teachers *Colorado Science Conference, Denver, CO.*

2012, **Adams, W. K.** Problem Solving Assessment 164th Meeting of the Acoustical Society of America, *Kansas City, MO.*

2012, **Adams, W. K.** Student Conceptual Understanding of Electrostatic Potential and Views About Learning Physics. *Physics Education Research Conference, 2012, Philadelphia, PA.*

2012, Armstrong, Z. B., Galovich, C. and **Adams, W. K.** Determining the Effectiveness of PhET Interactive Simulations as Homework. *American Association of Physics Teachers 2012 Summer Meeting, Philadelphia, PA.*

2012, **Adams, W. K.**, Dietz, R. D., Semak, M. R. and Willis, C. W. Force Concept Inventory Interviews. *American Association of Physics Teachers 2012 Summer Meeting, Philadelphia, PA.*

2012, Galovich, C., **Adams, W. K.** and Reinsvold, R. Secondary Teacher Preparation at the University of Northern Colorado. *American Association of Physics Teachers 2012 Summer Meeting, Philadelphia, PA.*

2012, **Adams, W. K.**, Acoustics Materials: Activity Kit for Teachers. *American Association of Physics Teachers 2012 Summer Meeting, Philadelphia, PA.*

2012, **Adams, W. K.**, Barbera, J., Perkins, K. and Wieman, C. CLASS – Beyond Content: Insights Gained by Assessing Student Perceptions and beliefs of Physic and Chemistry. *2012 UNC Assessment Fair Showcase, Greeley, CO.*

2012, **Adams, W. K.** and Galovich, C. Simulations vs. Real equipment in physics labs. *American Association of Physics Teachers 2012 Winter Meeting, Ontario, CA.*

2012, **Adams, W. K.**, Educational materials created by the Acoustical Society of America. *American Association of Physics Teachers 2012 Winter Meeting, Ontario, CA*

2012, Dietz, R. D., **Adams, W. K.**, Semak, M. R., Willis, C. W. (2012). What's so special about question 23? *American Association of Physics Teachers Conference, 2012.Ontario, CA.*

2011, **Adams, W. K.**, Who is an Acoustician? *162nd Meeting of the Acoustical Society of America, San Diego, CA.*

2011, **Adams, W. K.**, Education Outreach Efforts of the Acoustical Society of America. *American Association of Physics Teachers 2011 Summering Meeting, Omaha, NE.*

2011, **Adams, W. K.**, Explore Sound. *American Association of Physics Teachers 2011 Summer Meeting, Omaha, NE.*

2011, Alhadlaq, Perkins, **Adams**, Al-Dossary, Perceptions and Beliefs of Undergraduate Physics Majors Toward Physics in Saudi Arabia. *American Association of Physics Teachers 2011 Summer Meeting Omaha, NE.*

2011, **Adams, W. K.** A research-based approach to teaching the basic concepts of musical instruments with low cost instruments. *161st Meeting of the Acoustical Society of America, Seattle, WA.*

2011, **Adams, W. K.** Integrating interactive simulations into demo sessions to help students visualize the invisible. *161st Meeting of the Acoustical Society of America, Seattle, WA.*

2011, **Adams, W. K.** Education Outreach Efforts of the Acoustical Society of America. *American Association of Physics Teachers Colorado/Wyoming Section Meeting, Denver, CO.*

2011, **Adams, W. K.** and Gilley, B. Insights into faculty perceptions of teaching. *American Association of Physics Teachers Conference 2011 Winter Meeting, Jacksonville, FL.*

2010, Yu, B. and **Adams, W. K.** Scenario based think aloud protocol for probing student problem solving skills. *2010 STEM in Education Conference, Brisbane, Australia.*

2010, Lancaster, K, **Adams W.**, Parson, R. and Perkins, K., PhET interactive simulations: New tools for teaching the particulate nature of matter. *American Chemical Society 2010, San Francisco, CA.*

2010, Perkins, K., Lancaster, K., Parson, R., and **Adams, W.**, PhET Interactive Simulations: Free, research-based resources for teaching and learning chemistry. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*

2010, **Adams, W. K.** and Gilley, B. Development of a Faculty Perceptions Survey. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*

2010, Podolefsky, N., **Adams, W. K.**, Lancaster, K. and Perkins, K.K. Complexity of computer simulations: Implications for sim design and learning. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*

2010, Perkins, K. K., Alhadlaq, H., **Adams, W. K.**, Alshaya, F., Alabdulkareem, S., and Wieman, C. E. A CLASS study of students' perceptions of physics in Saudi Arabia and the U.S. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*

2010, Perkins, K., **Adams, W.**, Alhadlaq, H., Podolefsky, N., Wieman, C. and the rest of the PhET Team New developments in the PhET Interactive Simulations Project. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*

2009, Smith, M. K., Wood, W. B., **Adams, W. K.**, Wieman, C. E., Knight, J. K., Guild, N., Su, T. T. Why Peer Discussion Improves Student Performance on In-class Concept Questions. *Society for Developmental Biology Meeting, San Francisco, CA.*

2009, Smith, M. K., Wood, W. B., **Adams, W. K.**, Wieman, C. E., Knight, J. K., Guild, N., Su, T. T. Why Peer Discussion Improves Student Performance on In-class Concept Questions. *Biology Scholars Program American Society for Microbiology, Washington, D.C.*

2009, Paulson, A. M., Perkins, K.K., **Adams, W.K.**, PhET Simulations: Should We Show the invisible? *Physics Education Research Conference 2009, Ann Arbor, MI*

2009, Podolefsky, N.P., **Adams, W.K.**, Wieman, C.E., Student Choices when Learning with Computer Simulations. *Physics Education Research Conference 2009, Ann Arbor, MI*

2009, Paulson, A. M., Perkins, K.K., **Adams, W. K.**, PhET Simulations: Should We Show the Invisible? *American Association of Physics Teachers 2009 Summer Meeting: Ann Arbor, MI*

2009, Podolefsky, N.S., Adams, W.K., Perkins, K.K. Analogy Use in PhET Simulation Design. *American Association of Physics Teachers 2009 Summer Meeting: Ann Arbor, MI*

2009, Podolefsky, N. P., **Adams, W. K.**, Research Frontiers for PhET Simulations. *Foundations and Frontiers of Physics Education Research, Bar Harbor, ME.*

2009, Smith, M., Wood, W., **Adams, W.**, Wieman, C., Knight, J., Guild, N. and Su, T.T. Why peer discussion improves student performance on in-class concept questions. *Science Education Initiative End of Term Event, Boulder, CO.*

2009, Smith, M., Lykke-Anderson, J., **Adams, W.**, Wood, W., Knight, J. and Krauter, K. A combination of peer discussion and instructor explanation provides the most effective way for students to learn from in-class concept questions. *Science Education Initiative End of Term Event, Boulder, CO.*

2009, **Adams, W.K.**, & Wieman, C. E. Colorado Assessment of Problem Solving (CAPS) – Identifying student’s problem solving skills. *2009 American Physical Society April Meeting, Denver, CO.*

2009, Podolefsky, N., **Adams, W.**, Perkins, K. Using Computer Simulations to Foster Concept Generalization. *2009 American Physical Society April Meeting, Denver, CO.*

2009, Paulson, A., Perkins, K., **Adams, W.**, Research on student use of computer simulations. *2009 American Physical Society April Meeting, Denver, CO.*

2009, Paulson, A., **Adams, W. K.**, Physics Education Research: A study of student engagement. *University of Northern Colorado Physics Seminar Series, Greeley, CO.*

2009, Barbera, J., **Adams, W. K.**, Perkins, K. K. and the rest of the PhET Team. Free simulations for the teaching and learning of chemistry: The PhET project. *American Chemical Society 2009 National Meeting, Salt Lake City, UT.*

2008, Smith, M. K., Wood, W. B., **Adams, W. K.**, Wieman, C. E., Knight, J. K., Guild, N., Su, T. T. Why Peer Discussion Improves Student Performance on In-class Concept Questions. *The American Society for Cell Biology in 2008, San Diego, CA.*

2008, **Adams, W.K.**, McKagan, S., Perkins, K., Reid, S., Wieman, C. Study of Computer Simulations – Interface Design for Engagement Learning and Assessment. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB Canada.*

2008, Paulson, A., **Adams, W.K.**, Perkins, K., Research on Effective Features of Simulations and Classroom Use Implications. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB Canada.*

2008, **Adams, W.K.**, Wieman, C.E. Identification of Specific cognitive Processes Used for In-Depth Problem Solving. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB Canada.*

2008, Paulson, A., **Adams, W.K.**, Perkins, K.K. New Research on Effective Features of Interactive Simulations. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB Canada.*

2008, Paulson, A., Perkins, K., **Adams, W.K.**, Wieman, C., and the rest of the PhET Team. New Developments in PhET's Interactive Simulations Project. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB, Canada.*

2008, McKagan, S.B., Perkins, K.K., **Adams, W.K.**, Dubson, M., Malley, C., Reid, S., LeMaster, R., Wieman, C.E. Developing and Researching PhET Simulations for Teaching Quantum Mechanics. *American Association of Physics Teachers 2008 Summer Meeting: Edmonton, AB, Canada.*

2008, **Adams, W.K.**, Wieman, C.E. Colorado Assessment of Problem Solving (CAPS) – Design and Validation. *American Association of Physics Teachers 2008 Summer Meeting: Edmonton, AB, Canada.*

2008, **Adams, W.K.**, Paulson, A., Wieman, C.E. What Levels of Guidance Promote engaged Exploration with Interactive Simulation? *Physics Education Research Conference 2008, Edmonton, AB, Canada.*

2008, Paulson A., **Adams, W. K.**, Perkins, K. K., Wieman, C.E. The Physics Education Technology (PhET) Project (2008) *International Society for Design and Development in Education, Egmond aan Zee, Netherlands*

2008, **Adams, W.K.**, A study of Educational Simulations – Interface Design for Engagement and Learning. *2008 Gordon conference on Physics Research and Education, Smithfield, RI.*

2007, **Adams, W.K.**, Wieman, C.E. Problem Solving Skills Hold Across Discipline. *American Association of Physics Teachers 2007 Summer Meeting, Greensboro, NC.*

2007, **Adams, W.K.**, Reid, S., LeMaster, R., McKagan, S., Perkins, S., Wieman, C. Study of Educational Simulations? Interface Design for Engagement and Learning. *American Association of Physics Teachers 2007 Summer Meeting, Greensboro, NC.*

2007, **Adams, W.K.**, Wieman, C.E. Physics Problem Solving Skills and Evaluation. *American Association of Physics Teachers 2007 Summer Meeting, Greensboro, NC.*

2007, Keller, C., **Adams, W.K.**, Perkins, K., Wieman, C. New Developments in the PhET Interactive Simulations. *American Association of Physics Teachers 2007 Summer Meeting, Greensboro, NC.*

2007, **Adams, W.K.**, Wieman, C.E. Physics Problem Solving Component Skills and Evaluation. *Physics Education Research Conference 2007, Greensboro, NC.*

2007, **Adams, W.**, Wieman, C., Validation Studies of a Physics Problem Solving Survey. *American Physical Society March Meeting, Denver, CO.*

2007, Perkins, K. K., **Adams, W. K.**, Gratny, M., Pollock, S. J., Wieman, C. E., Studying the importance of students' beliefs in physics education. *American Physical Society March Meeting, Denver, CO.*

2007, Perkins, K. K., **Adams, W. K.**, Gray, K. E., Gratny, M., Pollock, S. J., Wieman, C. E. Correlating students' beliefs about physics with learning, retention, and recruitment. *American Physical Society March Meeting, Denver, CO.*

2007, Perkins, K. K., **Adams, W. K.**, Gratny, M., Pollock, S. J., Wieman, C. E. Correlating students' beliefs about physics with learning, retention, and recruitment. *American Physical Society March Meeting, Denver, CO.*

2007, Gray, K. E., **Adams, W. K.**, Wieman, C. E., Perkins, K. K., Student's Opinions of Physicists' Beliefs about Physics Versus Their Own. *American Physical Society March Meeting, Denver, CO.*

2007, Gray, K. E., **Adams, W. K.**, Wieman, C. E., Perkins, K. K. Do Students Know What Physicists Think About Physics? *American Physical Society March Meeting, Denver, CO.*

2007, **Adams, W. K.**, Reid, S., LeMaster, R., McKagan, S., Perkins, K., Wieman, C. Study of Interface Design for Engagement and Learning with Educational Simulations. *American Association of Physics Teachers 2007 Summer Meeting, Seattle, WA.*

2007, Wieman, C. E., Perkins, K. K. and **Adams, W. K.**, Oersted Medal Lecture 2007: Interactive Simulations for teaching physics: What works, what doesn't and why. *American Association of Physics Teachers 2007 Summer Meeting, Seattle, WA.*

2006, **Adams, W. K.**, Wieman, C. E. Problem Solving Skill Evaluation Instrument – Validation Studies. *Physics Education Research Conference 2006, Syracuse, NY*

2006, **Adams, W. K.**, Perkins, K. P., Barbera, J., Wieman, C. E. Chemistry vs. Physics: A Comparison of How Biology Majors View Each Discipline. *Physics Education Research Conference 2006, Syracuse, NY.*

2006, **Adams, W. K.**, Wieman, C. E. Validation Studies of the Colorado Physics Problem Solving Survey. *American Association of Physics Teachers 2006 Summer Meeting, Syracuse, NY.*

2006, **Adams, W. K.**, Reid, S., LeMaster, R., Perkins, K. K., Podolefsky, N., Wieman, C. E., Interface Design Guidelines: A Study of Student Learning. *American Association of Physics Teachers 2006 Summer Meeting, Syracuse NY.*

2006, Gray, K. E., Perkins, K. K., **Adams, W. K.**, Wieman, C. E., Do Students Know What Physicists Think About Physics? *American Association of Physics Teachers 2006 Summer Meeting, Syracuse, NY.*

2006, Perkins, K. K., **Adams, W. K.**, Quinn, E., Wieman, C. E., The Evolution of Students' Beliefs and interest in Physics. *American Association of Physics Teachers 2006 Summer Meeting, Syracuse, NY.*

2006, Perkins, K. K., McKagan, S., **Adams, W. K.**, Dubson, M., Harlow, D., Koch, L. Loeblein, P., Wieman, C. E. and the rest of the PhET Team., New Developments in the PHET Interactive Simulations. *American Association of Physics Teachers 2006 Summer Meeting, Syracuse, NY.*

2006, McKagan, S., Perkins, K. K., **Adams, W. K.**, Harlow, D., Dubson, M., Malley, C., Reid, S., LeMaster, R. Wieman, C. E., Teaching Quantum Mechanics with PHET Simulations. *American Association of Physics Teachers 2006 Summer Meeting, Syracuse, NY.*

2005, **Adams, W. K.**, Perkins K. P., Podolefsky, N. P., Finkelstein, N. D., and Wieman, C. E., Men and women know experts' beliefs about science, but disagree. *American Physical Society 4 corners meeting, Boulder, CO.*

2005, Perkins, K. P., **Adams, W. K.**, Pollock, S. J., Finkelstein, N. D., and Wieman, C. E., Correlating Students' Beliefs about Physics with Learning, Retention and Recruitment. *American Physical Society 4 corners meeting, Boulder, CO.*

2005, **Adams, W. K.**, Perkins K. P., Podolefsky, N.P., Finkelstein, N. D., and Wieman, C. E., Men and women know experts' beliefs about science, but disagree. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, **Adams, W. K.**, Perkins, K. P. and Wieman, C. E., A new Statistical Analysis for Determining Survey Categories. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, **Adams, W. K.** and Wieman, C. E., Creating a Physics Problem Solving Survey. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, Perkins, K. P., **Adams, W. K.**, Maytag, C., and Wieman, C. E., Using PhET Simulations in Class: Helpful Guidance and a User Database. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, Perkins, K. P., **Adams, W. K.**, Pollock, S. J., Finkelstein, N. D., and Wieman, C. E., Correlating Students' Beliefs about Physics with Learning, Retention and Recruitment. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, Perkins, K. K., Barbera, J., **Adams W. K.**, Pollock, S. J., Finkelstein, N. D. and Wieman, C. E., Studying the Importance of Students' Beliefs in Physics and Chemistry Education. *American Association of Physics Teachers 2005 Summer Meeting, Salt Lake City, UT.*

2005, Perkins, K. K., Gratny, M.M., **Adams, W. K.**, Finkelstein, N. D., and Wieman, C. E., Towards characterizing the relationship between students' interest in and their beliefs about physics. *Physics Education Research Conference 2005, Salt Lake City, UT.*

2005, **Adams, W.K.** and Wieman, C.E. Problem solving skills and evidence of their independence and transferability. *Physics Education Research Conference 2005, Salt Lake City, UT.*

2005, Perkins, K. P., **Adams, W. K.**, Pollock, S., Finkelstein, N. D., and Wieman, C. E., Correlating Students' Beliefs about Physics with Students' Learning. *American Association of Physics Teachers 2005 Winter Meeting, Albuquerque, NM.*

2005, Perkins, K. K., **Adams, W. K.**, Finkelstein, N. D., Reid, S., LeMaster, R., Dubson, M., Podolefsky, N. and Wieman, C.E. Incorporating PhET Simulations into Courses and Impacts on Student Learning. *American Association of Physics Teachers 2005 Winter Meeting, Albuquerque, NM.*

2004, **Adams, W.K.**, Perkins, K.P., Finkelstein, N. D., and Wieman, C.E., The Physics Education Technology Project: Research-Based Design Features of Web-based Simulations. *Teaching with Technology Conference, Boulder, CO.*

2004, **Adams, W. K.**, Perkins, K. P., Finkelstein, N.D., LeMaster, R., Reid, S., Dubson, M., Podolefsky, N.P. and Wieman, C.E. Research-Based Design Features of Web-Based Interactive Simulations. *American Association of Physics Teachers 2004 Summer Meeting, Sacramento, CA.*

2004, **Adams, W.K.**, Finkelstein, N.D. and Wieman, C., Using the Colorado Learning Attitudes about Science Survey to Probe Students' Attitudes and Beliefs About Reality. *American Association of Physics Teachers 2004 Summer Meeting, Sacramento, CA.*

2004, **Adams, W. K.**, Dubson, M., Finkelstein, N. D. and Wieman, C. E. The Design and Validation of the Colorado Learning Attitudes about Science Survey. *American Association of Physics Teachers 2004 Summer Meeting, Sacramento, CA.*

2004, Perkins, K. P., **Adams, W. K.**, Finkelstein, N. D., and Wieman, C. E. Learning Physics with Simulations: The Role of Interactivity, Animation and Context. *American Association of Physics Teachers 2004 Summer Meeting, Sacramento, CA.*

2004, **Adams, W. K.**, Perkins, K. K., Dubson, M., Finkelstein, N.D. and Wieman, C.E. The Design and Validation of the Colorado Learning Attitudes about Science Survey. *Physics Education Research Conference 2004, Sacramento, CA.*

2004, Perkins, K., **Adams, W.K.**, Pollock, S., Finkelstein, N. and Wieman, C. Correlating Student Attitudes with Student Learning Using the Colorado Learning Attitudes about Science Survey. *Physics Education Research Conference 2004, Sacramento, CA.*

2004, Finkelstein, N.D., Perkins, K. P., **Adams, W.K.**, and Kohl, P. Can Computer Simulations Replace Real Lab Equipment in Undergraduate Laboratories? *Physics Education Research Conference 2004, Sacramento, CA.*

2004, Podolefsky, N.P., **Adams, W.K.** and Finkelstein, N.D. Analogical Scaffolding of Abstract Ideas in Physics. *Physics Education Research Conference 2004, Sacramento, CA.*

2001, Mallory, K. and **Adams, W.** The Physics of Turns in Classical Dance. *American Association of Physics Teachers 2001 Winter Meeting, San Diego, CA.*

2001, Mallory, K, and **Adams, W.** An Advanced Engineering Course for the Physics Major. *American Association of Physics Teachers 2001 Winter Meeting, San Diego, CA.*

1996, **Anderson, W.** Lead Graduate Teacher Program. *National Convocation on Science and Engineering Doctoral Education organized by the National Academy of Sciences, National Academy of Engineering and Institute of Medicine, Washington, D.C..*

1994, **Anderson, W.** and Mallory, K., Electron band Structure of polyacetylene in the presence of a random potential energy field, *American Association of Physics Teachers 1994 Winter Meeting, San Diego, CA.*

1993, **Anderson, W.** and Mallory, K. Study of a Two-Element Nonlinear Pendulum. *American Physical Society April Meeting, Washington, D.C.*

PREVIOUS POSITIONS

Education Coordinator	2010 - 2013
Acoustical Society of America, American institute of Physics.	
Affiliate Faculty	2010 - 2011
Department of Physics and Astronomy, University of Northern Colorado.	
Director of Research	2008 - 2010
Science Education Initiative, University of Colorado.	
Co-Director	2008 - 2010
PhET Interactive Simulations, Department of Physics, University of Colorado.	
Business Manager	2006 - 2008
PhET Interactive Simulations and Science Education Initiative University of Colorado.	
Research Assistant	2003 – 2007
Department of Physics, University of Colorado.	
Lecturer	1996 – 2003, and 2005
Department of Physics, University of Northern Colorado.	
Research Assistant	1995 – 1996
JILA (Joint Institute for Laboratory Astrophysics), University of Colorado, Boulder, Colorado	
Lead Graduate Teacher	1995 – 1996
Graduate Teacher Program, University of Colorado.	
Teaching Assistant	1994 – 1995
Department of Physics, University of Colorado, Boulder, Colorado	
Research Assistant - Nuclear Theory	1993
Indiana University Cyclotron Facility, Indiana University, Bloomington, Indiana	

PRE 2014 INVITED PRESENTATIONS

- 2013, Problem Solving, *Keynote for University of Nebraska Astronomy Workshop #16, Lincoln, NE.*
- 2013, Models and Simulations with Pre-Service Elementary Teachers *American Association of Physics Teachers 2013 Summer Meeting, Portland, OR.*
- 2013, Clarifying the Force Concept Inventory. *Global Physics Department, virtual meeting.*
- 2013, Panel: Confessions of First-year Faculty. *American Association of Physics Teachers 2013 Winter Meeting, New Orleans, LA.*
- 2012, Measuring the Effect of Instruction. *Acoustics 2012 Hong Kong, Hong Kong, China.*
- 2012, Research-based, student-tested, free educational resources, *Colloquium for the Department of Physics and Astronomy, Brigham Young University, Provo, UT.*
- 2011, Hands-on acoustics for public school students. *162nd Meeting of the Acoustical Society of America, San Diego, CA.*
- 2011, Fourier Making Waves. *162nd Meeting of the Acoustical Society of America, San Diego, CA.*
- 2011, Possible ways to integrate PhET into your class. *Department of Engineering and Science Education Seminar, Clemson University, Clemson, SC.*
- 2011, Possible ways to integrate simulations into your classroom. *GIREP-EPEC (Groupe International de Recherche sur l'Enseignement de la Physique –European Physics Education Conference) 2011 International Conference, Jyväskylä, FINLAND.*
- 2011, Problem Solving Evaluation. *American Association of Physics Teachers 2011 Summer Meeting, Omaha, NE.*
- 2011, Using Interactive Simulations to Visualize Fourier Analysis. *161st Meeting of the Acoustical Society of America, Seattle, WA.*
- 2011, Factor Analysis 1-2-3 and the benefits of the Reduced-Basis Factor Analysis. *American Association of Physics Teachers 2011 Winter Meeting, Jacksonville, FL.*
- 2010, PhET Interactive Simulations: Student Engagement and Learning. *American Association of Physics Teachers 2010 Summer Meeting, Portland, OR.*
- 2009, PhET Interactive Simulations. *American Association of Physics Teachers New Faculty Workshop Series, Washington, D.C.*
- 2009, Balanced Challenges – Student Engagement and Learning? *Simon Frasier University Colloquium. Vancouver, BC CANADA.*
- 2009, Student Engagement and Learning with PhET Interactive Simulations. *International Workshop on Multimedia in Physics Teaching and Learning – 14th, Udine, ITALY. Plenary Speaker.*
- 2009, A Balance – Effective Levels of Guidance for Student Engagement and Learning. *American Physical Society American Association of Physics Teachers Physics and Astronomy New Faculty Workshop Series Reunion Meeting at American Physical Society March Meeting. Pittsburg, PA.*
- 2009, Balance – Level of Guidance for Learning and Engagement. *University of British Columbia. Vancouver, BC CANADA.*
- 2008, Attending to more than Content Mastery *TIGER/CIRTL Workshop Series, University of Colorado, Boulder, CO.*
- 2008, A Study of Educational Simulations – Interface Design for Engagement and Learning. *American Association of Physics Teachers 2008 Summer Meeting, Edmonton, AB, CANADA.*

2008, A Study of Educational Simulations – Interface Design for Engagement and Learning. *Gordon Research Conference: Physics Research and Education - Computation and Computer-Based Instruction. Providence, RI.*

2008, Problem Solving: Understanding and evaluating the many component skills, processes and beliefs. *University of Northern Colorado, Physics Department Seminar Series, Greeley, CO.*

2008, Problem Solving: Understanding and evaluating the many component skills, processes and beliefs. *University of British Columbia, Vancouver, BC CANADA.*

2007, Physics Education Research. *University of Northern Colorado, Chemistry Education Research Seminar, Greeley, CO.*

2006, Problem Solving Evaluation Instrument – Validation Studies. *Physics Education Research Conference 2006, Syracuse, NY.*

2005, Physics Education Technology Project, *University of Northern Colorado, Physics Department Seminar Series, Greeley, CO.*

PRE 2014 WORKSHOPS PRESENTED

2013, The Value and Limitations of Models in Science, *University of Nebraska Astronomy Workshop #16, Lincoln, NE.*

2013, PhET Interactive Simulations for the Classroom *University of Nebraska Astronomy Workshop #16, Lincoln, NE.*

2013, Sound and Music, Ways to Teach It, *American Association of Physics Teachers 2013 Summer Meeting, Portland, OR.*

2013, Sound and Music, Ways to Teach It, *American Association of Physics Teachers 2013 Winter Meeting, New Orleans, LA.*

2012, Sound and Music for 7th grade girls *164th Meeting of the Acoustical Society of America, Kansas City, KS. Presenter*

2012, Sound and Music for 7th grade boys *164th Meeting of the Acoustical Society of America, Kansas City, KS. Presenter*

2012, Listen Up! And Get Involved. Girl Scout outreach held at the *164th Meeting of the Acoustical Society of America, Kansas City, KS. Presenter*

2012, Sound and Music, Ways to Teach It, *American Association of Physics Teachers 2012 Summer Meeting, Philadelphia, PA. Presenter*

2012, Labs at Many Levels, *American Association of Physics Teachers Summer 2012 Conference, Philadelphia, PA. Co-Presenter*

2011, Listen Up! And Get Involved. Girl Scout outreach held at the *162nd Meeting of the Acoustical Society of America San Diego, CA. Presenter.*

2011, Sound and Music for Middle School *American Association of Physics Teachers/Physics Teacher Resource Agent Summer Leadership Institute*

2011, Education Statistics – ANOVA to the rescue! *Carl Wieman -Science Education Initiative STLF Group*

2010, Student Interviews - Test validation and problem solving *Carl Wieman -Science Education Initiative STLF Group*

2010, Education Statistics – z-scores, t-tests and correlations *Carl Wieman -Science Education Initiative*

2010, Education Statistics – Chi-squared analysis *Carl Wieman – Science Education Initiative*

2010, Education Statistics I – Mean, z-test, uncertainty and correlations. *Science Education Initiative Training Series*

2010, Education Statistics II – T-test or ANOVA? *Science Education Initiative Training Series*

2010, Education Statistics III – Empirical Probability *Science Education Initiative Training Series*

2010, Student Interviews *Carl Wieman – Science Education Initiative STLF Group*

2009, Teacher and Researcher: Designing research studies around PhET's interactive simulations. (w/ Perkins and Paulson) *American Association of Physics Teachers Summer National Meeting 2009*. ½ day workshop.

2009, How to create an effective pre/post test for your TAR project. *TIGER/CIRTL Workshop Series Graduate Teacher Program University of Colorado* (w/Perkins invited 1 hour)

2008, Education Statistics I – Mean, z-test, uncertainty and correlations *Carl Wieman – Science Education Initiative NOJO group*.

2008, Education Statistics III – Empirical Probability *Science Education Initiative Training Series*

2008, Exploring Easy and Effective ways to use PhET's web-based interactive simulations. (w/ Podolefsky and Paulson) *American Association of Physics Teachers Summer National Meeting*. ½ day workshop.

2008, Education Statistics I – Mean, z-test, uncertainty and correlations *Carl Wieman – Science Education Initiative STLF group*.

2008, Education Statistics II – T-test or ANOVA? *Science Education Initiative Training Series*

2008, Education Statistics I – Mean, z-test, uncertainty and correlations *Science Education Initiative Training Series*

2007, Writing Inquiry Lessons using PhET simulations. (w/ Loeblein, Perkins and McKagan) *National Science Teachers Association Area Conference*. (1 hour)

2007, Exploring Easy and Effective ways to use PhET's web-based interactive simulations. (w/ Perkins, McKagan and Dubson) *American Association of Physics Teachers Summer National Meeting 2007*. ½ day workshop.

2007, Attending to more than Content Mastery (w/Perkins, Pollock and Finkelstein) *Physics Teacher Education Coalition 2007 Conference*. (1 ½ hours)

2007, Exploring Easy and Effective ways to use PhET's web-based interactive simulations. (w/ Perkins and McKagan) *American Association of Physics Teachers Winter National Meeting 2007*. ½ day workshop.

2006, Exploring Easy and Effective ways to use PhET's web-based interactive simulations. (w/ Perkins and Loeblein) *American Association of Physics Teachers Summer National Meeting 2006*. ½ day workshop.

2006, Physics Education Technology Project. *Thompson Valley High School Professional Development Workshop*.

PROFESSIONAL SERVICE

Current

American Association of Physics Teachers 1992 – Present
 Chair, *Committee on Teacher Preparation*, 2015
Programs Committee, 2015-2016

Friend, *Physics in High Schools Committee*, 2012 – Present
Friend, *Physics in Pre-High School Education*, 2011 – Present
Friend, *Research in Physics Education Committee*, 2009 – Present

American Association of Physics Teachers CO/WY Section

2015, Vice President

American Physical Society

1995 – Present

Executive Committee of the American Physical Society's Forum on Education (FEd)

2014 – 2017, APS-AAPT Member

Excellence in Physics Education Award selection Committee, 2015 Vice-Chair

FEd Nominating Committee, 2015

The Physics Teacher Editorial Board

2015 - present

Past

Acoustical Society of America

2010 - 2014

2012 - 2014, Full Member, 2010 – 2011, Associate Member

Committee on Online Services, 2011 - 2012

Adhoc Committee Sounds Project, 2011 - 2013

Committee on Archives and History, 2011 - 2013

Adhoc committee for the Activity Kits for Teachers, 2010 - 2013

Women in Acoustics Committee, 2010 - 2013

Public Relations Committee, 2010 - 2013

Committee for International Research and Education, 2010 - 2013

Adhoc Committee for the Website for Kids, 2010 - 2011

Education Committee, 2010 - 2014

2013 Session Chair – invited session: Engaging and Effective Teaching Methods in Acoustics

2012 Session Chair – invited session: Engaging and Effective Teaching Methods in Acoustics

2012 Session Chair – invited session: Engaging and Effective Teaching Methods in Acoustics

American Association of Physics Teachers

Committee on Teacher Preparation

2014 Vice-Chair; 2013 – 2015 Member; 2011 – 2012 Friend

S2014, Session Presider/Organizer Invited session: Preparing Physics teachers to Teach in Diverse Environments

W2014, Session Presider/Organizer Invited session: Low Enrollment Teacher Preparation Programs

2013, Session Presider/Organizer Invited Session: Preparation of Future Elementary Teachers.

2013, Session Presider/Organizer Invited session: Physics Preparation for Pre-service Elementary Teachers.

Physics in High Schools Committee, 2012 – Present, Friend

2015 Panel Presider/Organizer, 30 Demos in 60 Minutes

American Institute of Physics

Advisory Committee on Physics Education, 2011 – 2015

American Physical Society

Executive Committee of the American Physical Society's Forum on Education (FEd)

2014, FEd Program Committee, Organizing Committee for APS 2015 March and April Meetings.

Discovery of Sounds in the Sea – www.DOSITS.org

2011 – 2012 Advisory Board

Grant Reviewer

2012 & 2013 National Science Foundation

Referee

American Journal of Physics, Computers & Education, International Journal of Science Education, Journal of the Acoustical Society of America, Journal of Engineering Education, Journal of the Learning Sciences, Physics Education Research Conference Proceedings, Physical Review – Special Topics, Physics Education Research, The Physics Teacher, Science, Science Education

Reviews

American Association for the Advancement of Science - AAAS Project 2061 – Green Schools Energy Curriculum.

2010 Assessment handbook, Assessing for Learning.

College Physics by Coletta and Science Teaching Reconsidered: A Handbook by Committee on Undergraduate Science Education

Chemistry in Your Life by Baird and Gloffke

UNIVERSITY SERVICE

Current

Walking Mountains Science Center Partnership	2015 – Present
Develop new Elementary science curriculum: 7 new courses	2015

Committees

Faculty - Member-at-Large, Professional Education Council	2014 – 2017
Chair, Science Education (SCED) Committee	2014 – Present
Elementary Teacher Preparation Advisory Committee	2014 – Present
Secondary Education Advisory Committee	2013 – Present
Mines/UNC Partnership Leadership Team	2013 – Present
Physics Department	2010 - Present

Preview Day Major Presentation, Transfer Advising, Advise Students, Fill in for faculty absences, clean/organize research and demo spaces

Past

University of Northern Colorado

Search Committee: Physics/Science Education Faculty Position	2014 – 2015
Search Committee: Chemistry Faculty Position	2014 – 2015
Search Committee: Physics/Science Education Faculty Position	2013 – 2014
Colorado Teacher Preparation Symposium Organizing Committee	2013 – 2014
SCED secondary education sub-committee member	2011 – 2014
Colorado Department of Higher Education STEM Action Committee	2013 – 2014
SCED (SCience EDucation) committee member	2011 – 2014
Search Committee: Science Education Administrative Assistant III Position	2013
Chair - Secondary Methods Redesign sub-committee	2013

PTEP Faculty Retreat January	2013
PTEP Faculty Retreat June	2013
Work with Audiology on new Interactive Acoustics Course	2013
Work with Biology to evaluate physics preparation of students for the MCAT	2013
SCED (SCience EDucation) sub-committee to evaluate the Graduate Interdisciplinary Degree Program M. A. Natural Sciences K-12 Teaching Emphasis.	2012 – 2013
NOYCE Advisory Board Meeting – attended in lieu of school director	2012
Search Committee: Physics Administrative Assistant II Position	2012
Physics Department	2003
Committee for redesign of UNC physics curriculum	
Walsh, R., Galovich, C. and Adams, W. Physics 220 and 221 laboratory manual, <i>University of Northern Colorado</i> .	
Assisted with Physics Department moves during renovation of Ross Hall, Covered Phys 240/220/241/221 labs for others, Conducted help sessions for Physics 240	
Advise undergraduates, Assisted in keeping Physics Department website updated	
Organized introductory lab equipment and cleaned stock room	
Physics Department	1996 – 2002
Tutored individuals struggling with Modern Physics, Physics 240 Help Sessions, Advise Undergraduate Physics Majors	
Committee for UNC Departmental Evaluation (student member)	1993 - 1994
<i>University of Colorado, Boulder, Colorado</i>	
Chair, Evaluation of Human Subjects Research practices for Science Education.	2009 - 2010
Physics Department	2009
Filled in for Phys 1020 for Paul Beale	

COMMUNITY SERVICE

Development of the Creative Elementary Science Teaching Awards	2015 – Present
Double Physics Demo Show, University High School Chemistry Students	2015
Physics Demo Show, CO/WY Academy of Science, UNC	2015
UNC Science Teacher’s Demo Show, <i>Little Shop of Physics Open House</i>	2015
Eaton School District STEM Academy Curriculum Committee	2014 - Present
Double Physics Demo Show, University High School Chemistry Students	2014
Double Physics Demo Show, University High School Chemistry Students	2013
Physics Demo show/tutorial for 6 th and 7 th grade Bella Romero Dream Team	2013
Longs Peak Science Fair – 30 demos in 50 minutes with secondary methods students	2013
ExploreSound.org website.	2011 - 2013
Sound & Music Teacher Activity Kit, distributed internationally to 270 recipients	2011 - 2013
Free Sound & Music Activity Kits for Teachers, Colorado Science Conference, Denver, CO	2012
American Institute of Physics Big Top Physics, USA Science and Engineering Festival, Washington, DC	2012
Listen Up! And Get Involved. Girl Scout Outreach, Seattle, WA, San Diego, CA,	2011 – 2012

Kansas City, MO	
Our Ears! <i>Little Shop of Physics Open House</i> , Fort Collins, CO	2011
Grader for 6 th grade math Union Colony Charter School, Greeley, CO	2010
Coach/Organizer Mountain View Academy Elementary and Middle School Chess Club (26 - 1 st – 8 th graders.), Greeley, CO	2008 - 2010
Science Fair Judge – Broomfield Heights Middle School, Broomfield, CO	
Odyssey of The Mind Coach for problem solving team. (6 - 3 rd graders), Greeley, CO	2005

GRANTS - EXPIRED

- 2014, Reinsvold, **Adams**, Reinsvold, Keenan, Gill Foundation: Gay and Lesbian Fund for Colorado, **Colorado STEM Teacher Preparation Symposium**, \$5,000.
- 2013, Reinsvold, **Adams**, Reinsvold, Keenan, Gill Foundation: Gay and Lesbian Fund for *Colorado*, **Colorado STEM Teacher Preparation Symposium**, \$5,000
- 2013, **Adams**, UNC Summer Support Initiative category 2: Research, Scholarship and Creative Works: Open Focus. Submission of manuscript: *Analyzing the many skills involved in solving complex physics problems*, \$3,000.
- 2013, **Adams**, UNC Grant-writing Incentive Program (GRIP) *Evaluation of problem solving skills - the quintessential expression of human thinking* \$2,000
- 2010 - 2013, Perkins, **Adams**, Wieman, Schwartz. NSF-DRK12 **Expanding PhET Interactive Science Simulations to Grades 4-8: A Research Based Approach**. \$1,997,695 (Transferred Adams and Wieman to Podolefsky and Dubson)
- 2009 – 2010, Jona, Wieman, **Adams**, Perkins, Sicker, Blumenthal, Long and McGee. NSF-ITEST, **Collaborative Research: Conference on Cyberlearning Tools for STEM Education**, CU side: \$24,410.
- 2008 – 2011, **Adams**, Perkins, Hewlett Foundation, **PhET Interactive Simulations**, \$1,100,000.
- 2008 – 2010, **Adams**, Wieman, King Saud University, **PhET ECSME Initiative**, \$500,000.
- 2008 – 2011, Perkins (**Adams** Sr. Personnel) NSF-CCLI, **Physics and Chemistry Education Technology Project**, \$498,765.
- 2008, Wieman, **Adams**, Microsoft Research, **Towards the next generation of simulations for learning**. \$50,000.
- 2008, **Adams**, Texas Instruments, **Physics Education Technology Project**, \$50,000.

PROFESSIONAL CONSULTATION

- 2015, University of North Carolina, Chapel Hill, NC.
AAU STEM Education Initiative.
- 2014 - Present, Stanford University, Stanford, CA
Wieman group, Department of Physics and Graduate School of Education
- 2010 – 2012, Massachusetts Institute of Technology, Boston, MA
External Evaluator, NSF DUE Grant: Assessing, Improving, and Guiding Users to NSDL Resources, Dave Pritchard – PI
- 2008 – 2012, University of British Columbia, Vancouver, British Columbia, Canada
Carl Wieman – Science Education Initiative
- 2010 – 2011, University of Colorado, Boulder, Colorado
Science Education Initiative and the PhET Interactive Simulations Project