

Curriculum Vitae

Noah Podolefsky

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Education

Ph.D. Physics, May, 2008, University of Colorado at Boulder

B.S. Physics, December, 2000 *Magna Cum Laude*, University of Northern Iowa
Minor in Mathematics

Academic appointments

June 2008 – Research Associate for the Physics Education Technology (PhET) project.
Duties include design of interactive computer simulations for learning science (physics, chemistry, biology, geology, etc.) Research on student use and learning with computer simulations. Writing human subjects (IRB) protocols. Designing and testing curricula for use with computer simulations.

Fall 2007 – Recitation/Lab Coordinator, University of Colorado – Boulder
Secondary instructor for introductory physics with 500 student enrollment. Duties included overseeing recitations and laboratories, rewriting tutorials and labs for use in recitations, creating grading rubrics, supervising 14 teaching assistants, substitute lecturer. Duties also included teaching recitation / lab section.

January 2004 – present Research Assistant, University of Colorado - Boulder
Physics education research.

Summer 2002 – Fall 2003 Research assistant, University of Colorado - Boulder
Computational geophysics, modeling of earth's interior, tectonics.

Fall 2001 - Spring 2002 Teaching Assistant, University of Colorado - Boulder
Taught recitation and lab for introductory physics.

Fall 1999 Assistant Lab Supervisor, Physics Department, University of Northern Iowa

Fall 1999 Tutor, Physics Department, University of Northern Iowa

Summers 1998, 1999 – Research Assistant, Theoretical and Experimental Fluid Dynamics, University of Northern Iowa

Summer 1997 – Research Assistant, Condensed Matter, University of Northern Iowa

Summer 1996 – Research Assistant, Musical Acoustics, University of Northern Iowa

Recent Activities

- Project Advisor for the Asteroids! Project, an NSF funded museum exhibit on asteroids and space science, sponsored by the Space Science Institute, www.space-science-institute.org
- Began post-doctoral position with the Physics Education Technology (PhET) project.
- Successful defense of thesis, *Analogical Scaffolding: Making Meaning in Physics Through Representation and Analogy*. April 8, 2008.
- Range of research activities to study the use of analogy and representation in teaching and learning physics. See publications for results of this work.
- Research examining student use of textbooks in introductory physics courses. See publications for results of this work.
- Physics Education Technology (PhET) Project – assist with design and study of student learning using interactive computer simulations. Conducted interviews with students using simulations. Observed use of simulations in classrooms. See publications for results of this work. See also <http://phet.colorado.edu>
- Research activities on students' use of metaphor in understanding computer simulations, and the use of gestures by students while using computer simulations.
- Participation in a weekly reading seminar in physics education with graduate students, faculty, and staff.

Publications

N.S. Podolefsky, K.K. Perkins, W.K. Adams “Computer simulations to classrooms: tools for change.” PERC Proceedings (Invited), 2009, AIP

N.S. Podolefsky, W.K. Adams, C.E. Wieman “Student choices when learning with computer simulations.”, PERC Proceedings 2009, AIP

N.S. Podolefsky, N.D. Finkelstein "Salience of Representations and Analogies in Physics." PERC Proceedings 2007. AIP

N.S. Podolefsky, N.D. Finkelstein "Analogical scaffolding and the learning of abstract ideas in physics: Empirical studies." *Phys. Rev. ST - Phys. Educ. Res.* 3, 020104 (2007)

N.S. Podolefsky, N.D. Finkelstein "Analogical scaffolding and the learning of abstract ideas in physics: An example from electromagnetic waves." *Phys. Rev. ST - Phys. Educ. Res.* 3, 010109 (2007)

N.S. Podolefsky, N.D. Finkelstein “Reframing analogy: framing as a mechanism of analogy use.” PERC Proceedings 2006. AIP.

N.S. Podolefsky, N.D. Finkelstein “Use of analogy in learning physics: The role of representations.” *Phys. Rev. ST Phys. Educ. Res.* 2, 020101. (2006)

N.S. Podolefsky, N.D. Finkelstein “The Perceived Value of Textbooks: Students and instructors may not see eye to eye.” *The Physics Teacher* 44, 6, p. 338-342. (2006)

W.K. Adams, K.K. Perkins, N.S. Podolefsky, M. Dubson, N.D. Finkelstein, and C.E. Wieman “New instrument for measuring student beliefs about physics and learning physics: The Colorado Learning Attitudes about Science Survey.” *Phys. Rev. ST Phys. Educ. Res.* 2, 010101. (2006)

N.D. Finkelstein, W.K. Adams, C.J. Keller, P.B. Kohl, R. LeMaster, K.K. Perkins, N.S. Podolefsky, S. Reid “When learning about the real world is better done virtually: A study of substituting computer simulations for laboratory equipment.” *Phys. Rev. ST Phys. Educ. Res.* 1, 010103. (2005)

N. D. Finkelstein, K. K. Perkins, W. Adams, P. Kohl, and N.S. Podolefsky, "Can computer simulations replace real equipment in undergraduate laboratories?" PERC Proceedings 2004. (2005)

N.S. Podolefsky, A. McNamara, S. Zhong “The anisotropic and rheological structure of the oceanic upper mantle from a simple model of plate shear.” *Geophysical Journal International* 158, 1 (2004)

F. Behroozi and N. Podolefsky, "Capillary-gravity waves and the Navier-Stokes equation," *Eur. J. Phys.* 22(6), 587-593 (2001).

F. Behroozi and N. Podolefsky, "Dispersion of Capillary-gravity waves: A derivation based on conservation of energy," *Eur. J. Phys.* 22, 225-231 (2001).

Invited Talks and Posters

“Computer simulations to classrooms: cultural tools for learning physics”, poster presented at Physics Education Research Conference, targeted session on socio-cultural perspectives on PER, 7/30/09

“Role of Theory in PER – How we think about student thinking”, talk presented at Foundations and Frontiers of Physics Education Research (FFPER) conference, 6/6/09

“Analogical Scaffolding”, talk presented at Colorado School of Mines, 10/22/08.

Contributed Talks and Posters

N.S. Podolefsky and the PhET Team “Construction of Student Understanding with PhET Interactive Simulations”, talk presented at COLTT, 8/12/09

N.S. Podolefsky, N.D. Finkelstein “Distinguishing Salience, Abstraction, the Individual and the Community.” Poster presented at the 2008 Physics Education Research Conference.

N.S. Podolefsky, N.D. Finkelstein “Towards an Operational Definition of Abstraction in Physics Education Research.” Talk presented at the 2008 meeting of the American Association of Physics Teachers.

N.S. Podolefsky, N.D. Finkelstein "How to teach with analogies: A research based approach" Talk presented at the 2007 meeting of the American Association of Physics Teachers.

N.S. Podolefsky, N.D. Finkelstein "Teaching Physics With Analogies: An Example From Electromagnetic Waves" Poster presented at the 2007 meeting of the American Association of Physics Teachers and at the 2007 Physics Education Research Conference.

N.S. Podolefsky, N.D. Finkelstein “Teaching EM Waves Via Analogy” Poster presented at the 2006 meeting of the American Association of Physics Teachers.

N.S. Podolefsky, N.D. Finkelstein “Reframing Analogy: framing, blending, and representations as mechanisms of learning by analogy” Poster presented at the 2006 Physics Education Research Conference.

N.S. Podolefsky, N.D. Finkelstein “Suzie Doesn’t Read the Textbook – And She’s Getting an A” Talk presented at the 2005 Four Corners meeting of the American Physical Society.

N.S. Podolefsky, N.D. Finkelstein “Suzie Doesn’t Read the Textbook – And She’s Getting an A” Talk presented at the 2005 Physics Education Research Conference.

N.S. Podolefsky, N.D. Finkelstein “Johnny Doesn’t Read the Textbook – and He’s Getting an A” Poster presented at the 2005 Physics Education Research Conference.

N.S. Podolefsky, N.D. Finkelstein “Analogical scaffolding – a research based model of learning abstract ideas in physics” Poster presented at the 2005 Physics Education Research Conference.

N.S. Podolefsky, W.K. Adams, N.D. Finkelstein “Analogical Scaffolding of Abstract Ideas in Physics” Poster presented at the 2004 Physics Education Research Conference.

N.S. Podolefsky, S. Zhong, A.K. McNamara "The Anisotropic and Rheological Structure of the Oceanic Upper Mantle from a Simple Model of Plate Shear" Poster presented at the 2003 Fall meeting of the American Geophysical Union.

N.S. Podolefsky, S. Zhong, A.K. McNamara "The Rheological Structure of the Oceanic Upper Mantle from a Channel Flow Model " Poster presented at the 2003 Gordon Conference on the Interior of the Earth.

N.S. Podolefsky, S. Zhong "Constraints on the Mantle Rheology From Observations of Flexural Rigidity of Lithosphere at Seamounts" Poster presented at the 2002 Fall meeting of the American Geophysical Union.

Workshops Presented

Research and PhET simulations at 2009 AAPT summer meeting.

PhET at APS April meeting 2009.

PhET at 2009 Teachers Day.

PhET at 2008 AAPT summer meeting.

Honors

First place for outstanding student paper "Suzie Doesn't Read the Textbook – And She's Getting an A" presented in a talk at the 2005 Four Corners meeting of the American Physical Society.

Purple and Old Gold Award for Meritorious Scholarship – U. Northern Iowa

Feynmann Book Award, Physics Department – Spring 2000

Physics Symposium Scholarship – Sprint 1999 through Sprint 2000

Louis Begeman Memorial Scholarship – 1998-1999 academic year

Outstanding Performance in Introductory Physics Award – April 1997

Honor Society Memberships

Society of Physics Students

Sigma Pi Sigma – The National Physics Honor Society

Sigma Xi – The Scientific Research Society

Professional Memberships

American Physical Society

American Association of Physics Teachers

Skills and Qualifications

- Microsoft Office
- Adobe Photoshop, Illustrator
- Knowledge of computer hardware, networking, web site design
- Educational simulation design
- Programming ability in C, Fortran
- Certificate of machine shop skills from University of Colorado
- Building and repairing electronic equipment
- Scientific laboratory skills
- Knowledge of statistical methods
- Teaching college physics, curriculum development
- Physics tutor
- Experience conducting, transcribing, analyzing clinical interviews with students
- Public speaking