

Kelly Anne Miller

Gordon McKay Laboratory 321
9 Oxford St., Cambridge, MA 02138, USA
(617) 495-9616
kmiller@seas.harvard.edu

Education

Harvard University, Cambridge, MA (2010-15)

- Doctor of Philosophy in Applied Physics

Harvard University, Cambridge, MA (2010-12)

- Master of Science in Applied Physics

McGill University, Montreal, QC (2005-07)

- Master of Business Administration (Finance)

University of Vermont, Burlington, VT (2002-2005)

- Master of Science in Teaching (Physics)

University of Toronto, Toronto, ON (1999-2000)

- Bachelor of Science (Biochemistry)

McGill University, Montreal, QC (1994-1997)

- Bachelor of Education (Science)
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Data Science

Go Guardian,

- Data science consultant for educational technology start-up, April 2016-

Teaching Experience

Harvard Physics Lecturer, School of Engineering and Applied Sciences

- Physics as a Foundation for Science & Engineering (Applied Physics 50), Fall 2014-

Harvard Teaching Fellow

- Teaching and Communicating Physics (Physics 302), Spring 2014
- GSAS Classroom Assessment J-Term Workshop, January 2014
- Physics as a Foundation for Science & Engineering (Applied Physics 50), Fall 2012-Spring 2014
- Modern Optics and Quantum Electronics (Applied Physics 216), Fall 2012
- Methods of Educational Measurement (S-061A1&A2), Fall 2012
- Electricity & Magnetism (Physics 11b), Spring 2011
- Mechanics (Physics 11a), Fall 2010

Instructor

- The Study School (Physics, Chemistry & Robotics) Montreal, QC (2006-09)
 - The Gailer School (Physics, AP Calculus) Burlington, VT (2004-05)
 - West Island College (Physics & Sailing) Class Afloat, S.V. Concordia (2000-01)
 - Rosseau Lake College (Outdoor Education, Physics) Rosseau, Ontario (1998-2000)
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Research Activity

Harvard University, School of Engineering and Applied Sciences

- Physics Education Research (2010-; Dr. Eric Mazur)
- Student conceptual change in interactive teaching environments
- Formative assessment tools in project based learning
- Gain metrics for assessing conceptual inventory performance
- Use of Machine Learning Algorithms to automatically score online student assignments
- Photonics (2011-2015; Dr. Eric Mazur)
- Characterization of materials using ultrafast laser techniques

Massachusetts Institute of Technology, Computer Science and Artificial Intelligence Lab

- Online Learning (2011-; Dr. David Karger)
- Role of an online collaborative textbook annotation tools in a flipped, intro physics classroom

Research Activity (Continued)

Harvard Smithsonian Center for Astrophysics, Science Education Department

Psychometrics (2012-; Dr. Phillip Sadler, Dr. Nancy Cook)

- Analysis of distracter driven multiple-choice items developed for the Misconception-Oriented Standards-Based Resources for Teachers (MOSART) project

Tufts University, Center for Engineering Education and Outreach

Engineering Education Research (Summer 2009; Dr. Chris Rogers)

- Evaluation of LEGO robotics curriculum in teaching middle school science standards

University of Vermont, Department of Physics

Physics Education Research (2002-05; Dr. Kelvin Chu, Dr. Kevork Spartalian)

- Confronting students' preconceptions in the introductory physics laboratory

Publications and Selected Presentations

- Miller K, 2015. [Role of Pre-Course Student Characteristics on Student Learning in Interactive Teaching Environments](#). *Harvard Ph.D. Thesis*
- Miller K, Schell J, Ho A, Lukoff B, Mazur E, 2014. Response Switching and Self-Efficacy in Peer Instruction Classrooms. *Physical Review Special Topics: Physics Education Research*.
- Miller K, Lasry N, Chu K, Mazur E, 2013. Role of physics lecture demonstrations in conceptual learning. *Physical Review Special Topics: Physics Education Research*.
- Miller K, 2013 Use demonstrations to teach, not just entertain. *The Physics Teacher*.
- Miller K, Zyto S, Karger D, Mazur E, 2014. Improving online class forums by seeding discussions and managing section size. *Proceedings of the 2014 ACM annual conference on Learning @ Scale*.
- Fraser J, Timan A, Miller K, Dowd J, Tucker L, Mazur E, 2014. Teaching and physics education research: bridging the gap. *Reports on Progress in Physics*.
- Dowd J, Miller K, Lukoff B, Lasry N, Mazur E, 2013. "Stratagrams" for assessment of Force Concept Inventory performance: A 12,000 student analysis. *American Journal of Physics*. (Submitted)
- Miller K, Lasry N, Dowd J, Araujo I, Mazur E, 2010. Losing it: The influence of loss on individuals' normalized gain. *Proc. PERC*.
- Physics lecture demonstrations and student conceptual change. 2013. *American Association of Physics Teachers Conference*, New Orleans, LA.
- Direct laser writing of 3D silver nanostructures. 2013. *Material Research Society Conference*, Boston, MA.
- Chemical and Z-scan analysis on the direct laser writing of 3D nanofabrication of metal structures. 2013. *SPIE Photonics West Conference*, San Francisco, CA.
- Switching Behavior in the Peer Instruction Classroom. 2012. *PERC Conference*, Philadelphia, PA.
- To what extent is seeing not believing? 2011. *American Association of Physics Teacher Conference*, Omaha, NE.

Other

- Co-founder of *Perusall*, a Harvard-based, educational software start-up
- Proficient in STATA, experience with MySQL and Python
- Recipient of Liviu Librescu Research Fellowship, Harvard University, 2013
- Harvard University January Academy on Technology-Enabled Teaching and Learning participant
- Worked with Eric Mazur to design new project based Applied Physics course for undergraduates
- Dudley House Athletics Fellow, Harvard University (2011-)
- Director Summer Study Abroad Program for high school students at Oxford University (2006-07)
- Developed robotics program and integrated into science curriculum at The Study School (2007-09)
- Sailed around world on 188' barquentine school ship, S.V. Concordia (2000-01)
- Outward Bound Instructor, Hurricane Island, Maine (Summers 2002-03)

