

BETHANY R. WILCOX

Department of Physics
University of Colorado Boulder
390 UCB, Boulder, CO 80309

bethany.wilcox@colorado.edu

office: (303)-492-8759

EDUCATION

University of Colorado Boulder

Doctorate of Philosophy in Physics, May 2015

Dissertation Title: New Tools for Investigating Student Learning in Upper-division Electrostatics

Advisor: Steven J. Pollock

Masters of Science in Physics, 2012

Bachelors of Arts with Distinction in Physics and Astronomy, 2010

RESEARCH GRANTS AND FELLOWSHIPS

PI: National Science Foundation Grant No. 2143976, "CAREER: A Model for Achieving Flexible and Scalable Conceptual Assessment – A Prototype in Undergraduate Quantum Mechanics," \$745,089 (8/2022 – 7/2027)

PI: National Science Foundation Grant No. 2012147, "Collaborative Research: Assessing Undergraduate Student Learning in Upper-Level Courses in Thermal and Statistical Physics," \$283,182 (9/2020-8/2023)

PI: National Science Foundation Grant No. 2013332, "Collaborative Research: Connecting Spins-First Quantum Mechanics Instruction to Quantum Information Science," \$482,039 (9/2020-8/2024)

NSF Graduate Research Fellowship, 2012-2015

AWARDS AND RECOGNITIONS

Institute of Physics Outstanding Reviewer, 2019

Institute of Physics Outstanding Reviewer, 2018

European Journal of Physics Reviewer of the Year, 2017

Physics Education Research Topical Group Travel Award, Fall 2015

International Society of Engineering Educators Professional Development Program, 2014

University of Colorado Boulder United Government of Graduate Students Travel Award, 2012

Center for the Integration of Research, Teaching, and Learning Network Exchange, 2012

Society Photographic Instrumentation Engineers Scholarship, 2009

RESEARCH EXPERIENCE

University of Colorado Boulder – Department of Physics, August 2018-Present

Assistant Professor

Physics Education Researcher: Understanding student difficulties with mathematical tools in physics problem solving across the curriculum. Developing and validating conceptual assessments that can be

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used as a large-scale comparative measure of student learning as well as address the issue of variable content coverage in upper-division thermal and quantum physics.

University of Colorado Boulder – Department of Physics, June 2015-December 2016

Research Associate

Advisor: Dr. Heather Lewandowski

Physics Education Researcher: Validating an attitudinal assessment targeted at understanding student epistemologies and expectations about the nature of experimental physics. Assembling and analyzing a national data set of student responses to this assessment.

University of Colorado Boulder – Department of Physics, August 2010-May 2015

Graduate Researcher

Advisor: Dr. Steven Pollock

Physics Education Researcher: Understanding student difficulties with mathematics in junior level Electricity and Magnetism. Developing and validating conceptual assessments that can be used as a large-scale comparative measure of student learning in upper-division electrostatics.

University of Colorado Boulder, August 2010-December 2012

Graduate Researcher

Advisor: Dr. Doug Duncan

CIRTL Researcher: Investigating the effect of different note taking styles as well as laptop and cell phone use during class on student learning outcomes.

SETI Institute – Mountain View, CA, Summer 2009

Undergraduate Researcher

Advisor: Dr. Gerald Harp

REU Intern: Analyzing radio frequency observations of nearby star systems for the signs of artificial signals. Characterizing the behavior of the Allen Telescope Array at high frequencies

University of Colorado Boulder – Department of Physics, August 2008-December 2009

Undergraduate Researcher

Advisor: Dr. Ivan Smalyukh

Liquid Crystal Researcher: Stabilizing a unique phase of liquid crystal at room temperature, with the ultimate goal of using liquid crystals as a medium for the formation of self-assembling periodic arrays of nanoparticles.

STUDENTS AND POST-DOCS MENTORED

Graduate Students

Katherine Rainey 2018-2021

Nathan Crossette 2019-2022 (anticipated)

Josephine Meyer 2021-Present

Giacò Corsiglia 2019-Present

Kristin Oliver 2021-Present

Undergraduate Students

James Huffman (2020)

Michael Freeman (current)

Josie Robbins (current)

Kristin Oliver (post-bac, 2021)

Post-docs

Michael Vignal 2019-2021

TEACHING EXPERIENCE

University of Colorado Boulder

Assistant Professor - Department of Physics

- Junior-level Quantum Mechanics 1: Spring 2022 (N=105)
- Senior-level Thermal Physics: Fall 2019 (N=70), Fall 2020 (N=86), Spring 2021 (N=56)
- Non-majors Light and Color: Spring 2019 (N=101)
- Junior-level Electrostatics: Fall 2018 (N=51), Spring 2020 (N=85)

Colorado School of Mines

Teaching Assistant Professor – Department of Physics

- Introductory Mechanics (N~500): Spring 2017, Fall 2017, Spring 2018

University of Colorado Boulder

Guest Lecturer – Department of Physics

- Junior-level electrostatics: Spring 2012, Spring 2013, Spring 2014, Spring 2015
- Introductory Physics 2: Fall 2014, Spring 2016

Recitation Instructor – Department of Physics, Fall 2011

Teaching Assistant – Department of Physics, Spring 2011, Fall 2010

Physics Tutor, Multiple Courses – Department of Physics, Fall 2010-Spring 2011

Undergraduate Teaching Assistant – Department of Astrophysical and Planetary Science, Spring 2010

Learning Assistant – Department of Physics, Spring 2010

Learning Assistant – Department of Astrophysical and Planetary Science, Fall 2009

PUBLICATIONS

Publications appearing in peer-reviewed journals

- 30) M. Vignal, **B. Wilcox**, (2021) Understanding student experiences with emergency remote teaching in Fall 2020, *Phys. Rev. PER*, In Preparation
- 29) K. Rainey, M. Vignal, **B. Wilcox**, (2021) Validation of a Coupled, Multiple Response Assessment for Upper-Division Thermal Physics, *Phys. Rev. PER*, In Preparation
- 28) M. Vignal, **B. Wilcox**, (2022) Investigating Unprompted and Prompted Diagrams Generated by Physics Majors During Problem Solving, *Phys. Rev. PER*, Res. 18, 010104
- 27) N. Crossette, M. Vignal, **B. Wilcox**, (2021) Investigating graduate student reasoning on a conceptual entropy questionnaire, *Phys. Rev. PER*, 17, 020119
- 26) B. V. Dusen, M. Shultz, J. M. Nissen, **B. Wilcox**, N. G. Holmes, M. Jariwala, E. Close, H. J. Lewandowski, S. Pollock, (2020) Online administration of research-based assessments, *Am. J. Phys.* **89**, 7
- 25) **B. Wilcox**, M. Vignal (2020) Recommendations for emergency remote teaching based on the student experience, *The Physics Teacher*, **58**, 374

- 24) K. Rainey, M. Vignal, **B. Wilcox** (2020) Designing upper-division thermal physics assessment items informed by faculty perspectives of key content coverage, *Phys. Rev. PER*, **16**, 020113
- 23) **B. Wilcox**, S. Pollock, D. Bolton (2020) Retention of conceptual learning after an interactive introductory mechanics course, *Phys. Rev. PER*, **16**, 010140
- 22) **B. Wilcox**, G. Corsiglia (2019) Cross-context look at upper-division student difficulties with integration, *Phys. Rev. PER*, **15**, 020136
- 21) **B. Wilcox**, S. Pollock (2019) Investigating students' behavior and performance in online conceptual assessment, *Phys. Rev. PER*, **15**, 020145
- 20) Q. Ryan, **B. Wilcox**, S. Pollock (2018) Student difficulties with boundary conditions in the context of electromagnetic waves, *Phys. Rev. PER*, **14** 020126
- 19) D. Vargas, A. Bridgeman, D. Schmidt, P. Kohl, **B. Wilcox**, L. Carr (2018) Correlation between student collaboration network centrality and academic performance, *Phys. Rev. PER*, **14** 020112
- 18) D. Hu, B. Zwickl, **B. Wilcox**, H. Lewandowski (2017) Qualitative investigation of students' views about experimental physics, *Phys. Rev. PER*, **13** 020134
- 17) **B. Wilcox**, H. Lewandowski (2017) A summary of research-based assessment of students' beliefs about the nature of experimental physics, *Am. J. Phys.*, **86**, 212
- 16) **B. Wilcox**, H. Lewandowski (2017) Improvement or Selection? A longitudinal analysis of students' views about the nature of experimental physics in their lab courses, *Phys. Rev. PER*, **13** 023101
- 15) **B. Wilcox**, H. Lewandowski (2017) Students' views about the nature of experimental physics, *Phys. Rev. PER*, **13** 020110
- 14) **B. Wilcox**, H. Lewandowski (2017) Developing skills versus reinforcing concepts in physics labs: Insight from a survey of students' beliefs about experimental physics, *Phys. Rev. PER*, **13** 010108
- 13) **B. Wilcox**, H. Lewandowski (2017) Open-ended versus guided laboratory activities: Impact on students' beliefs about experimental physics, *Phys. Rev. PER*, **12** 020132
- 12) **B. Wilcox**, H. Lewandowski (2016) Research-based assessment of students' beliefs about experimental physics: When is gender a factor?, *Phys. Rev. PER*, **12** 020130
- 11) **B. Wilcox**, H. Lewandowski (2016) Alternative model for assessment administration and analysis, *Phys. Rev. PER*, **12** 010139
- 10) **B. Wilcox**, H. Lewandowski (2016) Students' epistemologies about experimental physics: Validating the Colorado Learning attitudes about Science Survey for Experimental Physics, *Phys. Rev. PER*, **12** 010123
- 9) **B. Wilcox**, S. Pollock (2015) Upper-division Student difficulties with Separation of Variables, *Phys. Rev. ST-PER*, **11** 020131
- 8) **B. Wilcox**, S. Pollock (2015) Validation and analysis of the coupled multiple-response Colorado upper-division electrostatics diagnostic, *Phys. Rev. ST-PER*, **11** 020130
- 7) **B. Wilcox**, M. Caballero, C. Baily, H. Sadaghiani, S. Chasteen, Q. Ryan, S. Pollock (2015) Development and uses of upper-division conceptual assessments, *Phys. Rev. ST-PER*, **11** 020115
- 6) S. Chasteen, **B. Wilcox**, M. Caballero, K. Perkins, S. Pollock, C. Wieman (2015) Educational transformation in upper-division physics: The Science Education Initiative model, outcomes, and lessons learned, *Phys. Rev. ST-PER*, **11** 020110
- 5) M. Caballero, **B. Wilcox**, L. Doughty, S. Pollock (2015) Unpacking students' use of mathematics in upper division physics: Where do we go from here?, *Eur. J. Phys.* **36**, 065004

- 4) **B. Wilcox**, S. Pollock (2015) Upper-division Student Difficulties with the Dirac Delta Function, *Phys. Rev. ST-PER*, **11**, 010108
- 3) **B. Wilcox**, S. Pollock (2014) Coupled Multiple-Response vs. Free-response Assessment: An example from Upper-division Physics, *Phys. Rev. ST-PER*, **10** 020124
- 2) **B. Wilcox**, M. Caballero, S. Pollock (2013) Analytic Framework for Students' Use of Mathematics in Upper-Division Physics, *Phys. Rev. ST-PER*, **9**(2) 020119
- 1) Duncan D., Hoekstra A., **Wilcox B.** (2012). Digital Devices, Distraction and Student Performance – Does Cell Phone Use Reduce Learning? *Astronomy Education Review*, **11**(1), 010108

Publications appearing in peer-reviewed conference proceedings

- 24) N. Crossette, M. Vignal, **B. Wilcox**, (2021) Comparing undergraduate and graduate student reasoning on a conceptual entropy questionnaire, In Proceedings 2021 *Physics Education Research Conference*, p. 105-110
- 23) E. Scanlon, M. Vignal, **B. Wilcox**, J. Chini, (2021) Students' use of disability accommodations in emergency remote teaching, In Proceedings 2021 *Physics Education Research Conference*, p. 384-389
- 22) B. Cervantes, **B. Wilcox**, S. Pollock, G. Passante, (2021) An Overview of Quantum Information Science Courses at US Institutions, In Proceedings 2021 *Physics Education Research Conference*, p. 93-98
- 21) J. Meyer, G. Passante, S. Pollock, M. Vignal, **B. Wilcox** (2021) Investigating students' strategies for interpreting quantum states in an upper-division quantum computing course, In Proceedings 2021 *Physics Education Research Conference*, p. 289-294
- 20) K. Oliver, **B. Wilcox** (2021) Understanding combinatorics challenges in an upper-division thermodynamics course, In Proceedings 2021 *Physics Education Research Conference*, p. 315-320
- 19) M. Vignal, **B. Wilcox** (2021) Physics Problem-Solvers on Why They Generate Unprompted Diagrams, In Proceedings 2021 *Physics Education Research Conference*, p. 420-425
- 18) **B. Wilcox**, M. Vignal (2020) Understanding the student experience with emergency remote teaching, In Proceedings 2020 *Physics Education Research Conference*, p. 581-586
- 17) M. Vignal, **B. Wilcox** (2020) Comparing Unprompted and Prompted Student-Generated Diagrams, In Proceedings 2020 *Physics Education Research Conference*, p. 551-556
- 16) N. Crossette, M. Vignal, **B. Wilcox** (2020) Investigating how graduate students connect microstates and macrostates with entropy, In Proceedings 2020 *Physics Education Research Conference*, p. 98-103
- 15) K. Rainey, A. P. Jambuge, J. T. Lavery, **B. Wilcox** (2020) Developing coupled, multiple-response assessment items addressing scientific practices, In Proceedings 2020 *Physics Education Research Conference*, p. 418-423
- 14) A. P. Jambuge, K. Rainey, **B. Wilcox**, J. T. Lavery (2020) Assessment feedback: A tool to promote scientific practices in upper-division, In Proceedings 2020 *Physics Education Research Conference*, p. 234-239
- 13) J. Huffman, M. Vignal, **B. Wilcox** (2020) Investigating Upper-Division Students' Interpretations of the Divergence Theorem, In Proceedings 2020 *Physics Education Research Conference*, p. 222-227
- 12) **B. Wilcox**, S. Pollock (2019) Student behavior and test security in online conceptual assessment, In Proceedings 2019 *Physics Education Research Conference*, p. 645-650
- 11) K. Rainey, **B. Wilcox** (2019) Faculty survey on upper-division thermal physics content coverage, In Proceedings 2019 *Physics Education Research Conference*, p. 494-499
- 10) K. Callan, **B. Wilcox**, W. Adams (2017) Testing group composition within the studio learning environment. In Proceedings 2017 *Physics Education Research Conference*, p. 72-75

- 9) **B. Wilcox**, H. Lewandowski (2017) Impact of Grading Practices on Students' beliefs about Experimental Physics, In Proceedings *2017 Physics Education Research Conference*, p. 19-22
- 8) **B. Wilcox**, H. Lewandowski (2016) Impact of instructional approach on students' epistemologies about experimental physics, In Proceedings *2016 Physics Education Research Conference*, p. 388-391
- 7) **B. Wilcox**, H. Lewandowski (2015) Correlating students' beliefs about experimental physics with lab course success, In Proceedings *2015 Physics Education Research Conference*, p. 367-370
- 6) S. Pollock, **B. Wilcox** (2015) Upper-division students' use of Separation of Variables, In Proceedings *2015 Physics Education Research Conference*, p. 259-262
- 5) Q. Ryan, **B. Wilcox**, S. Pollock (2015) Student difficulties with Boundary Conditions, In Proceedings *2015 Physics Education Research Conference*, p.283-286
- 4) **B. Wilcox**, S. Pollock (2014) Student difficulties with the Dirac Delta Function, In Proceedings *2014 Physics Education Research Conference*, p. 271-274
- 3) **B. Wilcox**, S. Pollock (2013) Multiple-choice Assessment for Upper-division Electricity and Magnetism, In Proceedings *2013 Physics Education Research Conference*, p. 365-368
- 2) **B. Wilcox**, M. Caballero, R. Pepper, S. Pollock (2012) Upper-division Student Understanding of Coulomb's Law: Difficulties with Continuous Charge Distributions. In Proceedings *2012 Physics Education Research Conference*, **1513**, p. 418-421
- 1) M. Caballero, **B. Wilcox**, R. Pepper, S. Pollock (2012) ACER: A Framework on the use of Mathematics in Upper-Division Physics. In Proceedings *2012 Physics Education Research Conference*, **1513**, p. 90-93

PRESENTATIONS AND POSTERS

Invited conference presentations

- B. Wilcox**, H.J. Lewandowski (2019) Students' beliefs about the nature of experimental physics, *Pacific Northwest Association for College Physics and Oregon Section American Association of Physics Teachers Conference*, Beaverton, OR
- B. Wilcox** (2017) Investigating students' use of mathematics in upper-division problem solving, *2017 Physics Education Research Conference*, Cincinnati, OH
- B. Wilcox** (2017) Interactive engagement techniques in advanced physics courses – Development, effectiveness, and sustainability, *The 2017 Conference of International Research Group on Physics Teaching*, Dublin, Ireland
- B. Wilcox**, H.J. Lewandowski (2017) Students' beliefs about the nature of experimental physics, *48th Annual Meeting of the APS Division of Atomic, Molecular, and Optical Physics*, Sacramento, CA
- B. Wilcox**, M. Caballero, C. Baily, H. Sadaghiani, S. Chasteen, Q. Ryan, S. Pollock (2016) Development and uses of upper-division conceptual assessments, *2016 American Association of Physics Teachers Winter Meeting*, New Orleans, LA
- B. Wilcox**, S. Pollock (2014) Coupled Multiple-response vs. Free-response Formats in Upper-division Conceptual Assessment. *2014 American Association of Physics Teachers Summer Meeting*, Minneapolis, MN
- B. Wilcox**, M. Caballero, D. Rehn, S. Pollock (2013) An Analytic Framework for Students' Use of Mathematics in Upper-division Physics, *Global Physics Department*, globalphysicsdept.org
- B. Wilcox**, S. Pollock, C. Baily (2013) Active Learning in Upper-division Physics, *International Conference on Nuclear Data for Science and Technology*, New York, NY

Departmental Colloquia

- B. Wilcox** (2020) Scalable and flexible measures of student learning across time and context, *University of Maine Physics Department Colloquium*, February 2020, Orono, MN
- B. Wilcox**, S. Pollock (2016) Investigating Student Learning in Upper-division Electrostatics, *Texas Tech University Physics Department Colloquium*, March 2016, Lubbock, TX
- B. Wilcox**, S. Pollock (2014) Tools for Educational Transformation in Upper-division Electrostatics, *Cal. State University Fullerton Departmental Colloquium*, December 2014, Fullerton, CA

Departmental Seminars

- B. Wilcox** (2021) Understanding and measuring student learning across time, content, and educational context, *Cornell University Discipline-Based Education Research Seminar*, Virtual
- B. Wilcox** (2020) Understanding and measuring student learning across time, content, and educational context, *Michigan State University Physics Education Research Lab Seminar 2020 virtual series*, Virtual
- B. Wilcox** (2018) Measuring students' epistemologies about experimental physics, *Kansas State University Physics Education Research Group Meeting*, Virtual, March 2018
- B. Wilcox**, H. Lewandowski (2016) Measuring students' epistemologies about experimental physics, *Texas Tech University Physics Education Research Group Meeting*, March 2016, Lubbock, TX
- B. Wilcox**, S. Pollock (2014) Physics Education Research at the Upper-division: What's so hard about Maxwell's Equations, *Equality through Awareness meeting*, Golden, CO
- B. Wilcox**, S. Pollock (2014) Coupled Multiple-response vs. Free-response Formats in Upper-division Conceptual Assessment. *Discipline-Based Educational Research meeting*, Boulder, CO
- B. Wilcox**, E. Sperandio, D. Duncan, A. Hoekstra (2012) The Nexus Between Teaching and Communication Technologies: How Clickers, Laptops, and Cell Phones Affect Student Learning, *Discipline-Based Educational Research meeting*, Boulder, CO
- D. Duncan, A. Hoekstra, **B. Wilcox** (2011). Learning and Interactive Behavior in Large Lecture Classes: Note-taking, Laptop Use, Cell Phone Use and Grades. *Discipline-Based Educational Research meeting*, Boulder, CO
- D. Duncan, A. Hoekstra, **B. Wilcox** (2011). Assessing Correlations between Clicker Use, Note-taking Methods and Learning Outcomes in Three Large Science Classes. *Discipline-Based Educational Research meeting*, Boulder, CO

Contributed talks

- J. Meyer, G. Passante, S. Pollock, **B. Wilcox** (2021) Preliminary Findings from a Survey of Quantum Information Science Instructors, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2021) Comparing undergraduate and graduate student reasoning on a conceptual entropy questionnaire, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- M. Vignal, **B. Wilcox** (2021) Asking why students and instructors draw diagrams while problem solving, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- M. Vignal, **B. Wilcox** (2021) Student experiences with emergency remote teaching in Fall 2020, *2021 American Association of Physics Teachers Winter Meeting*, Virtual Meeting

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- A.P. Jambuge, K. Rainey, A. Sirnookar, **B. Wilcox**, J.T. Lavery, (2021) Research-based Assessment Feedback for Instructors, *2021 American Association of Physics Teachers Winter Meeting*, Virtual Meeting
- K. Rainey, A.P. Jambuge, A. Sirnookar, J.T. Lavery, **B. Wilcox** (2021) A Knowledge-in-Use Assessment for Upper-Division Thermal Physics, *2021 American Association of Physics Teachers Winter Meeting*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2020) Investigating how graduate students connect microstates and macrostates with entropy, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- M. Vignal, **B. Wilcox** (2020) Similarities and differences between unprompted and prompted student generated diagrams, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- K. Rainey, M. Vignal, **B. Wilcox** (2020) Initial Implementation of an Upper-Division Thermal Physics Assessment, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- B. Wilcox**, M. Vignal (2020) Understanding the student experience with emergency remote teaching, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- K. Rainey, **B. Wilcox**, (2019) Survey on Upper-Division Thermal Physics Content Coverage, *2019 American Association of Physics Teachers Summer Meeting*, Provo, UT
- B. Wilcox**, S. Pollock (2019) Student behavior and test security in online conceptual assessment, *2019 American Association of Physics Teachers Summer Meeting*, Provo, UT
- B. Wilcox**, K. Callan (2018) Impact of psychological interventions on gender gaps in introductory studio physics, *2018 American Association of Physics Teachers Summer Meeting*, Washington, DC
- B. Wilcox**, H. Lewandowski (2017) Impact of grading practices on student's beliefs about experimental physics, *2017 American Association of Physics Teachers Summer Meeting*, Cincinnati, OH
- B. Wilcox**, H. Lewandowski (2016) Gender differences in students' epistemologies about experimental physics, *2016 American Association of Physics Teachers Summer Meeting*, Sacramento, CA
- B. Wilcox**, H. Lewandowski (2016) Measuring students' epistemologies about experimental physics: Ongoing validation of the E-CLASS, *2016 American Association of Physics Teachers Winter Meeting*, New Orleans, LA
- B. Wilcox**, H. Lewandowski (2015) Correlating students' beliefs about experimental physics with lab course success, *2015 American Association of Physics Teachers Summer Meeting*, College Park, MD
- B. Wilcox**, S. Pollock (2015) Physics Education Research at the Upper-division: What's so hard about Maxwell's Equations, *AIMS Faculty Conference: Create Collaborate Evaluate*, Greeley, CO
- B. Wilcox**, S. Pollock (2014) Student difficulties with the Dirac Delta Function. *2014 American Association of Physics Teachers Summer Meeting*, Minneapolis, MN
- B. Wilcox**, S. Pollock (2013) In-Between Multiple-choice and Open-ended: Large-scale Assessment for Upper-division Physics? *2013 American Association of Physics Teachers Summer Meeting*, Portland, OR
- B. Wilcox**, M. Caballero, S. Chasteen, B. Zwickl, C. Baily, S. Pollock (2012) Resources for Research-based Instruction in Upper-Division Physics. *American Association of Physics Teachers Summer Meeting*, Philadelphia, PA
- B. Wilcox**, A. Hoekstra, D. Duncan (2012) Cell Phones in the Classroom: Digital Distraction and Student Performance. *American Association of Physics Teachers CO/WY Sectional Meeting*, Denver, CO
- B. Wilcox**, S. Pollock, R. Pepper, S. Chasteen (2012) Upper-Division Physics: Course Reforms and Student Difficulties. *CIRTL Network Exchange*, Vanderbilt University, Nashville, TN
- B. Wilcox**, A. Hoekstra, D. Duncan (2012) Digital Devices in the Classroom: Distraction and Student Performance. *CIRTL Network Exchange*, Vanderbilt University, Nashville, TN

- D. Duncan, A. Hoekstra, **B. Wilcox** (2012). Digital Devices, Distraction and Student Performance – Does Cell Phone Use Reduce Learning? Poster, *American Astronomical Society Meeting #219*, Austin, TX
- D. Gardner, **B. Wilcox**, I. Smalyukh (2009). Nanoparticle Decorated Cholesteric Blue Phases for Tunable Optical Metamaterials. *SPIE's Optics and Photonics Conference*, San Diego, CA.

Contributed posters

- J. Meyer, G. Passante, S. Pollock, M. Vignal, **B. Wilcox** (2021) Investigating students' strategies for interpreting quantum states in an upper-division quantum computing course, *2021 Physics Education Research Conference*, Virtual Meeting
- M. Vignal, **B. Wilcox** (2021) Physics problem solvers on why they generate unprompted student diagrams, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2021) Comparing undergraduate and graduate student reasoning on a conceptual entropy questionnaire, *2021 Physics Education Research Conference*, Virtual Meeting
- A.P. Jambuge, K. Rainey, A. Sirnookar, **B. Wilcox**, J.T. Lavery, (2021) Conceptualizing Assessments in PER Informed by Explicit Feedback for Instructors, *2021 Physics Education Research Conference*, Virtual Meeting
- K. Rainey, A.P. Jambuge, A. Sirnookar, J.T. Lavery, **B. Wilcox**, (2021) Faculty Perceptions of Three-Dimensional Learning Performances Addressing Thermal Physics, *2021 Physics Education Research Conference*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2021) Comparing undergraduate and graduate student reasoning on a conceptual entropy questionnaire, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2021) Network Analysis of Collaboration in Upper-Division Remote and Hybrid Courses, *2021 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- M. Vignal, **B. Wilcox** (2020) Comparing unprompted and prompted student-generated diagrams, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2020) Investigating how graduate students connect microstates and macrostates with entropy, *2020 Physics Education Research Conference*, Virtual Meeting
- N. Crossette, M. Vignal, **B. Wilcox** (2020) Investigating how graduate students connect microstates and macrostates with entropy, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- A. P. Jambuge, K. Rainey, **B. Wilcox**, J. T. Lavery, (2020) Assessment feedback: A tool to promote scientific practices in upper-division, *2020 Physics Education Research Conference*, Virtual Meeting
- K. Rainey, A. P. Jambuge, J.T. Lavery, **B. Wilcox**, (2020) Developing coupled, multiple-response assessment items addressing scientific practices, *2020 Physics Education Research Conference*, Virtual Meeting
- K. Rainey, A. P. Jambuge, J. T. Lavery, **B. Wilcox**, (2020) Addressing Scientific Practices with Upper-Division Physics Assessment Items, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- A. P. Jambuge, K. Rainey, **B. Wilcox**, J. T. Lavery, (2020) Assessing Scientific Practices in an Upper-Division Thermal Physics Course, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting
- B. Wilcox**, M. Vignal (2020) Understanding the student experience with emergency remote teaching, *2020 Physics Education Research Conference*, Virtual Meeting
- B. Wilcox**, M. Vignal (2020) Understanding the student experience with emergency remote teaching, *2020 American Association of Physics Teachers Summer Meeting*, Virtual Meeting

- K. Rainey, **B. Wilcox**, (2019) Survey on Upper-Division Thermal Physics Content Coverage, *2019 American Association of Physics Teachers Summer Meeting*, Provo, UT
- K. Rainey, **B. Wilcox**, (2019) Survey on Upper-Division Thermal Physics Content Coverage, *2019 Physics Education Research Conference*, Provo, UT
- B. Wilcox**, S. Pollock (2019) Student behavior and test security in online conceptual assessment, *2019 Physics Education Research Conference*, Provo, UT
- K. Callan, **B. Wilcox**, W. Adams (2017) Testing group composition within the studio learning environment. *2017 Physics Education Research Conference*, Cincinnati, OH
- B. Wilcox**, H. Lewandowski (2017) Impact of grading practices on student's beliefs about experimental physics, *2017 Physics Education Research Conference*, Cincinnati, OH
- B. Wilcox**, H. Lewandowski (2016) Impact of instructional approach on students' epistemologies about experimental physics, *8th Annual Symposium of STEM Education*, Boulder, CO
- B. Wilcox**, H. Lewandowski (2016) Impact of instructional approach on students' epistemologies about experimental physics, *2016 Physics Education Research Conference*, Sacramento, CA
- B. Wilcox**, H. Lewandowski (2015) Correlating students' beliefs about experimental physics with lab course success. Poster, *7th Annual Symposium of STEM Education*, Boulder, CO
- B. Wilcox**, H. Lewandowski (2015) Correlating students' beliefs about experimental physics with lab course success, *2015 Physics Education Research Conference*, College Park, MD
- S. Pollock, **B. Wilcox** (2015) Student difficulties with separation of variables, *2015 Physics Education Research Conference*, College Park, MD
- Q. Ryan, **B. Wilcox**, S. Pollock (2015) Student difficulties with Boundary Conditions, *2014 Physics Education Research Conference*, College Park, MD
- B. Wilcox**, S. Pollock (2015) Student difficulties with separation of variables, *2015 Foundations and Frontiers in Physics Education Research*, Bar Harbor, ME
- B. Wilcox**, S. Pollock (2014) Coupled Multiple-response vs. Free-response Formats in Upper-division Conceptual Assessment, *6th Annual Symposium of STEM Education*, Boulder, CO
- B. Wilcox**, S. Pollock (2014) Student Difficulties with the Dirac Delta Function. *2014 Physics Education Research Conference*, Minneapolis, MN
- B. Wilcox**, S. Pollock (2014) Coupled Multiple-response vs. Free-response Formats in Upper-division Conceptual Assessment. *2014 American Association of Physics Teachers Summer Meeting*, Minneapolis, MN
- B. Wilcox**, S. Pollock (2013) Multiple-choice Assessment for Upper-division Electricity and Magnetism. Poster, *5th Annual Symposium of STEM Education*, Boulder, CO
- B. Wilcox**, S. Pollock (2013) Large-scale Assessment for Upper-division Electricity and Magnetism. *2013 Physics Education Research Conference*, Portland, OR
- B. Wilcox**, S. Pollock (2013) Large-scale Assessment for Upper-division Electricity and Magnetism. *2013 American Association of Physics Teachers Summer Meeting*, Portland, OR
- B. Wilcox** (2013) University of Colorado Physics Education Research, *Conference on Undergraduate Women in Physics*, Golden, CO
- B. Wilcox**, D. Duncan, A. Hoekstra, E. Sperandio (2012) Digital Distraction and Student Performance. *4th Annual Symposium on STEM Education*, Boulder, CO
- A. Hoekstra, D. Duncan, **B. Wilcox**, E. Sperandio (2012) Put Your Phones Down Please: Digital Devices and Student Performance. *Center for STEM Learning Launch: VIP Reception*, Boulder, CO

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- B. Wilcox**, M. Caballero, R. Pepper, S. Pollock (2012) Upper-division Student Understanding of Coulomb's Law: Difficulties with Continuous Charge Distributions. *Physics Education Research Conference*, Philadelphia, PA
- M. Caballero, **B. Wilcox**, R. Pepper, S. Pollock (2012) ACER: A Framework on the use of Mathematics in Upper-Division Physics. *Physics Education Research Conference*, Philadelphia, PA
- B. Wilcox**, D. Duncan, A. Hoekstra, E. Sperandio (2012) Distraction in the Classroom: Digital Devices and Student Performance. *American Association of Physics Teachers Summer Meeting*, Philadelphia, PA
- D. Duncan, A. Hoekstra, **B. Wilcox**, E. Sperandio (2012) The Nexus between Teaching and Communication Technology: How Clickers, Laptops, and Cell Phones affect Student Learning. *SEI/iSTEM End-of-year-Event*, Boulder, CO
- B. Wilcox**, A. Hoekstra, D. Duncan (2011). Digital Devices and Distractions: Student Behavior and Learning Outcomes. *CIRTL National Forum*, Madison, WI
- G. Harp, **B. Wilcox**, J. Arbutich (2010). PiHI Observations at the ATA, Conventional and Unconventional SETI. Poster, *American Astronomical Society Meeting #215*, Washington, DC
- D. Gardner, **B. Wilcox**, I. Smalyukh (2009). Self-Assembly of Quantum Rods into Defects of Cholesteric Liquid Crystals. *Inter-Continental Advanced Materials for Photonics Summer School*, Beijing, China.
- D. Gardner, **B. Wilcox**, I. Smalyukh (2009). Self-Assembly of Quantum Rods into Defects of Cholesteric Liquid Crystals. *Soft Matter Workshop on Liquid Crystals and Colloidal Dispersions*, Livi, Ukraine.
- D. Gardner, **B. Wilcox**, I. Smalyukh (2008). Self-Organization and Self-Alignment of Fluorescent Nanoparticles by Liquid Crystal Elasticity and Defects. *Colorado Photonics Industry Association Conference*, Boulder, CO

PROFESSIONAL MEMBERSHIPS

American Physical Society (APS), 2012-Present
Topical Group on Physics Education Research (GPER)
Four Corners Section of APS

American Association of Physics Teachers (AAPT), 2012-Present
Physics Education Research Topical Group (PERTG)
CO/WY Section of AAPT

SERVICE

Faculty Advising Roles

C.O.S.M.O.S. (Community of Support for Marginalized Students) Student group

Professional Activities

University of Colorado Boulder, Physics Department 5-year Hiring Plan Committee, (2021-present)

University of Colorado Boulder, 2021 Selection Committee for the Joseph L. Frasca Teaching Excellence Award (2021)

Elected Physics Education Research Leadership and Organizing Council, (2019-Present, co-Chair 2022)
APS Nominating Committee of the Forum on Education (2019)

University of Colorado Boulder, Graduate Program Revision (2020-2021)

University of Colorado Boulder, Representation, Recruitment, and Retention committee (2020-present)

University of Colorado Boulder, Junior Faculty Advisory committee (2018-Present)

University of Colorado Boulder, Physics Advising committee (2018-Present)

University of Colorado Boulder, Graduate Research Opportunity Seminar (Chair, 2019-2020)

BETHANY R. WILCOX

University of Colorado Boulder, Strategic Planning committee (2019-2020)

University of Colorado Boulder, Graduate committee (2018-2019)

APS Topical Group in PER, GPER Grants committee (Chair, 2017-2020)

Colorado School of Mines, Readmissions committee (2017-2018)

Colorado School of Mines, Assessment committee (2017-2018)

CO/WY Sectional AAPT

Past President: 2016-2017, President: 2015-2016, President Elect: 2014-2015, Vice President: 2013-2014

Planned, organized, and hosted the 2014 spring meeting of the CO/WY section of the AAPT.

2017 APS Conference for Undergraduate Women in Physics

Executive Organizing Committee member, Advertising Committee Chair, Application Committee Chair

OUTREACH

Society of Women Engineers Girls Lead the Way: 2018

Organized and led the Physics portion of the event.

CU' (CU Prime) Volunteer Mentor: 2014-2015

Participated as a mentor in a one-on-one, graduate-led mentoring program designed to provide graduate mentors for undergraduate physics majors.

PISEC Summer Science Camp: Casa de la Esperanza Community Center, Longmont, CO

Worked as a volunteer with children ages 6-15 at a low-income housing project on science activities designed to let the students explore optics. Guided field-trip groups to visit physics labs CU Boulder.

Volunteer Panelist: Rocky Mountain Conference for Undergraduate Women in Physics, Golden, CO

Sat on the 'Life of a Graduate Student' Panel to answer questions from conference participants on how to prepare for graduate school.