

Melissa Eblen-Zayas

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EDUCATION AND PROFESSIONAL EXPERIENCE

Carleton College, Northfield, MN

Professor of Physics 2018 - present

Director, Perlman Center for Learning and Teaching &

Humphrey Doermann Professor of Liberal Learning 2016 - 2020

Chair, Department of Physics and Astronomy 2012 - 2016

Associate Professor of Physics 2011 - 2018

Assistant Professor of Physics 2005 - 2011

Ph.D., University of Minnesota, Minneapolis, MN

June 2005

Dissertation: "Electrical Modification of Disordered and Correlated Electron Systems"

Preparing Future Faculty Program

B.A. *magna cum laude*, Smith College, Northampton, MA

May 1999

Major: Physics Minor: History

Honors Thesis: "Calorimetric Investigation of Phase Transitions in Quasi-One-Dimensional Metals"

TEACHING INTERESTS & EXPERIENCE

- Teaching core courses throughout the introductory and intermediate physics curriculum, advanced courses in Electronics, Solid State Physics, and Contemporary Experimental Physics, and environmental studies elective, with a focus on increasing my use of evidence-based approaches to enhance inclusion and equity.
- Developed new courses in materials science (in Physics & Astronomy), materials and the environment (in Environmental Studies), and significantly redesigned the advanced lab course in physics to include a student-driven independent project component.
- Incorporated academic civic engagement projects in physics and environmental studies courses and developed new models for project streams to connect curricular and co-curricular opportunities. In 2015, received the Minnesota Campus Compact Presidents' Civic Engagement Steward Award.

RESEARCH INTERESTS & EXPERIENCE

- Interests include: 1) scholarship of teaching and learning (SoTL) and pedagogy, with a focus on quantitative skills in introductory courses and the physics advanced laboratory curriculum, and 2) experimental condensed matter physics research on the electronic and magnetic properties of correlated electron materials.
- Mentored over 50 students in undergraduate research during the academic year and the summer.

LEADERSHIP OF CURRICULAR & EDUCATIONAL DEVELOPMENT PROJECTS

- Conceptualized and led a multi-campus educational development pilot project for the LACOL consortium (11 small, liberal arts colleges) that created a framework for developing online modules focused on quantitative skills (QS) and their applications across the curriculum, and assessed faculty use of and student engagement with modules (2016-2017). This led to an externally-funded (\$290K) project (QLAB) aimed at improving understanding of effective practices to support students' QS development and the larger ecosystem of departmental and institutional QS support (2019-2025).
- Collaborating with colleagues across campus, led the proposal, design, and development of the hybrid Carleton Undergraduate Bridge Experience (CUBE) beginning in 2016 to provide a cohort of ~24 incoming first-year students the opportunity to review quantitative skills, explore their relevance in the liberal arts context, and create an early connection with the Carleton community. This included Carleton's first online course. Taught CUBE from 2016-2019.

LEADERSHIP OF FACULTY DEVELOPMENT PROJECTS/PROGRAMS

- In collaboration with the Associate Provost, developed and facilitated the President's Leadership Fellows Program for mid-career faculty in response to faculty interest, which launched in Fall 2024. This cohort program is designed to support faculty in building key skills for successful, sustainable, and inclusive leadership in a variety of different contexts and providing a deeper understanding of the institution.
- With colleagues from Luther College and St. Olaf College, designed and organized a year-long Teaching Fellows program (2022-23). This program developed a cohort of 15 faculty from a variety of disciplines and pedagogical approaches with expertise in peer observation of teaching and engaged these faculty members to provide teaching-related professional development opportunities for colleagues. We also developed and disseminated resources related to peer observation of teaching.
- As Director of the Perlman Center for Learning and Teaching (2016-2020), administered a programming portfolio that included weekly lunches, book groups, workshops, teaching circles, the junior-senior faculty observation program, the student observer program, and the senior faculty development forum. Approximately 50% of Carleton faculty members participated in at least one LTC program each year during the four-year period. Also organized mentoring programs for new faculty (tenure-stream and visiting) and post-docs, including identifying senior faculty mentors, coordinating programming, and facilitating the annual winter workshop for new faculty.

PUBLICATIONS

Book chapters

- 2024 M. Eblen-Zayas & J. Russell, "Learners Who Thrived: Pandemic Lessons About Course Design and Instruction," in *Online Learning, Open Education, and Equity in a Post-Pandemic World*, ed. B. Wuetherick, A. Germain-Rutherford, D. Graham, N. Baker, D.J. Hornsby, and N.K. Turner, Palgrave Macmillan.
https://doi.org/10.1007/978-3-031-69449-3_13
- 2022 M. Eblen-Zayas, "Reflect to Deflect: Using Metacognitive Activities to Address Student Perceptions of Instructor Competence and Caring," in *Picture a Professor: Intersectional Strategies for Interrupting Bias about Faculty and Increasing Student Learning*, ed. Jessamyn Neuhaus, West Virginia University Press.
- 2020 M. Eblen-Zayas, "Development and Supervision of Independent Projects," in *Experimental Physics: Principles and Practice for the Laboratory*, ed. W. F. Smith, CRC Press.

Peer-reviewed articles, conference proceedings, digests

- 2025 L. J. Muller, M. Eblen-Zayas, "A Framework for Strengthening The Quantitative Skills/Reasoning Support Ecosystem at Small Liberal Arts Colleges", *Numeracy* 18, Iss. 1: Article 3. doi:10.5038/1936-4660.18.1.1465
- 2024 M. Eblen-Zayas, M. Iommi, "Integrating Educational Development and Assessment of Student Learning Through Peer Review of Teaching." *Transformative Dialogues: Teaching and Learning Journal* Vol. 17, Issue 3, pg 82-91.
<https://doi.org/10.26209/td2024vol17iss31826>
- 2023 M. Eblen-Zayas, L. J. Muller, J. S. Russell, "Possibilities and Pitfalls of Practitioners in Trying to Apply Change Theory as Viewed Through the Lens of Reinholz, White, and Andrews 'Change theory in STEM higher education: a systematic review'", *International Journal of STEM Education*, 10(1), 53.
- 2022 M. Eblen-Zayas, K. M. Burson, D. McDermott, "Course modifications to support student mental health and move towards Universal Design for Learning", *The Physics Teacher* **60**, 628-631, doi:10.1119/5.0051626.
- M. Eblen-Zayas, L. Winton, "Building a Social and Academic Online Bridge to Quantitatively Rich College Coursework", *Numeracy* 15, Iss. 1: Article 3. doi:10.5038/1936-4660.15.1.1408
- 2021 M. Eblen-Zayas, "Promoting transparency when experienced faculty transition to online teaching", *Journal of Faculty Development*, **35** (2), 65
- 2020 M. Eblen-Zayas, E. Altermatt, L. Muller, J. Leamon, S. Richard, "Supporting student quantitative skills across introductory STEM courses: faculty approaches and perceived needs", *2020 Physics Education Research Conference Proceedings*, edited by S. Wolf, M. B. Bennett, and B. W. Frank, 137, doi:
[10.1119/perc.2020.pr.Eblen-Zayas](https://doi.org/10.1119/perc.2020.pr.Eblen-Zayas)
- 2019 M. Eblen-Zayas and Janet S. Russell, "Making an online bridge program high touch," *Journal of College Student Development* **60**, 104, doi: [10.1353/csd.2019.0006](https://doi.org/10.1353/csd.2019.0006)
- 2018 M. Eblen-Zayas and R. C. Terrien, "Lessons learned from five years of student self-directed experimental projects

- in the advanced lab," *2018 Conference on Laboratory Instruction Beyond the First Year of College Proceedings* [Baltimore, MD, July 25-27, 2018], edited by M. Eblen-Zayas, E. Behringer, M. Dark McNeese, and E. Geneston, doi:[10.1119/bfy.2018.pr.003](https://doi.org/10.1119/bfy.2018.pr.003)
- 2016 M. Eblen-Zayas, "The impact of metacognitive activities on student attitudes towards experimental physics," *2016 PERC Proceedings*, edited by D. L. Jones, L. Ding, and A. Traxler, 104, doi:[10.1119/perc.2016.pr.021](https://doi.org/10.1119/perc.2016.pr.021)
- 2015 M. Eblen-Zayas, "Comparing electronic and traditional lab notebooks in the advanced lab," *2015 Conference on Laboratory Instruction Beyond the First Year of College Proceedings*, edited by M. Eblen-Zayas, E. Behringer, and J. Kozminski, doi:[10.1119/bfy.2015.pr.007](https://doi.org/10.1119/bfy.2015.pr.007)
- 2013 M. Eblen-Zayas, "Development of a materials science course to serve diverse constituencies," *ASEE Annual Conference Proceedings*, <https://peer.asee.org/19430>
- 2010 M. Eblen-Zayas, T. Brenner, B. Colwell, C. Carter, B. Schuster, S. Schlotter, "Impact of substrate heating during growth on transport and magnetization response of Eu-rich EuO thin films," *11th Joint MMM/Intermag Conference Digest*, 1170
- 2005 M. Eblen-Zayas, A. Bhattacharya, N.E. Staley, A.L. Kobrinskii, A.M. Goldman, "Ambipolar Gate Effect and Low Temperature Magnetoresistance of Ultrathin $\text{La}_{0.8}\text{Ca}_{0.2}\text{MnO}_3$ Films," *Physical Review Letters* **94**, 037204.
A. Bhattacharya, M. Eblen-Zayas, N.E. Staley, A.L. Kobrinskii, and A.M. Goldman, "Low-temperature glassy response of ultrathin $\text{La}_{0.8}\text{Ca}_{0.2}\text{MnO}_3$ films to electric and magnetic fields," *Physical Review B* **72**, 132406
Kevin A. Parendo, K. H. Sarwa B. Tan, A. Bhattacharya, M. Eblen-Zayas, N. E. Staley, A. M. Goldman, "Electrostatic Tuning of the Superconductor-Insulator Transition in Two Dimensions," *Physical Review Letters* **94**, 197004
- 2004 A. Bhattacharya, M. Eblen-Zayas, N.E. Staley, W.H. Huber, A.M. Goldman, "Micromachined SrTiO_3 single crystals as dielectrics for electrostatic doping of thin films," *Applied Physics Letters* **85**, 997
- 1999 N. Fortune, M. Eblen, S. Uji, H. Aoki, J. Yamada, S. Tanaka, S. Maki, S. Nakatsuji and H. Anzai, "Field dependence of the specific heat and magnetothermal effect for $\alpha\text{-(BEDT-TTF)}_2\text{KHg(SCN)}_4$ in the density wave and high field ground states," *Synthetic Metals* **103**, 2078

Other publications

- 2014 J. Kozminski, N. Beverley, D. Deardorff, R. Dietz, M. Eblen-Zayas, R. Hobbs, H. Lewandowski, S. Lindaas, A. Reagan, R. Tagg, J. Williams, B. Zwickl, "AAPT Recommendations for the Undergraduate Physics Laboratory Curriculum," Report prepared by a subcommittee of AAPT Committee on Laboratories, https://www.aapt.org/Resources/upload/LabGuidelinesDocument_EBendorsed_nov10.pdf
- 2012 M. Eblen-Zayas, "Review: *Reliability in scientific research: Improving the dependability of measurements, calculations, equipment, and software* by I. R. Walker." *MRS Bulletin* **37**, 967 (2012).
- 2005 K.E. Daniels, M. Eblen-Zayas, A. Michelman-Ribeiro, J.M. Valentine, "Research Funding and Women in Physics," Women in Physics: Second IUPAP International Conference on Women in Physics, *AIP Conference Proceedings* **795**, 41
K.S. Budil, K.E. Daniels, T. Daniels-Race, M. Eblen-Zayas, B.K. Hartline, R. Hazeltine, A.K. Hodari, K.R. Horton, R. Ivie, L. Kay, L.J. Martinez-Miranda, A. Michelman-Ribeiro, M. Ong, J.I. Rudati, J. Valentine, B. Whitten, E. Williams, Y.V. Zastavker, "Women in Physics in the US: A Progress Report," Women in Physics: Second IUPAP International Conference on Women in Physics, *AIP Conference Proceedings* **795**, 175

GRANTS, FELLOWSHIPS, & AWARDS

External

- 2019-25 National Science Foundation Division of Education IUSE: "Online modules for quantitative skill building: Exploring adaption and adoption across a consortium", PI: Melissa Eblen-Zayas, Co-PIs: Sundi Richard, Davidson College, Laura Muller & Jonathan Leamon-Morgan, Williams College, Amount: \$290,940
- 2022-23 Associated Colleges of the Midwest Faculty and Career Enhancement Grant: "The Teaching Fellows Program", PI: Louis Epstein, St Olaf College, Co-PIs: Melissa Eblen-Zayas & Victoria Morse, Carleton College, Kate Elliot, Luther College, Amount: \$32,500.
- 2017-18 Associated Colleges of the Midwest Hybrid and Online Curricular Resources Grant: "Supporting Student Quantitative Skills Development across the Curriculum with Qbit Online Modules", Melissa Eblen-Zayas, Nathan Grawe, Deborah Gross, Daniela Kohen, Aaron Swoboda, Amount: \$16,975.

- 2010-13 National Science Foundation Major Research Instrumentation MRI-R²: “Acquisition of an x-ray diffractometer for powder and thin film materials characterization”, PI: Melissa Eblen-Zayas, Co-PIs: Cam Davidson & Steve Drew, Amount: \$305,000.
- 2008-13 National Science Foundation Division of Materials Research RUI: “EuO Thin Films as a Laboratory for Exploring Metal-Insulator Transitions and Colossal Magnetoresistance”, PI: Melissa Eblen-Zayas, Amount: \$144,590.
- 2007-10 Research Corporation Cottrell College Science Award: “Exploration of possible phase inhomogeneity in EuO thin films exhibiting a colossal magnetoresistance response”. Amount: \$22,911 with \$10,035 in matching funds.
- 2001-04 National Science Foundation Graduate Research Fellowship

Institutional

- 2024-25 Carleton College Targeted Opportunity Grant, “Exploring Approaches to Supporting Instructional and Institutional Change”
- 2024 Carleton College AI Curricular Development Grant, “Exploring AI Tools for Personalized Review and Practice”
- 2015 Carleton College HHMI Curriculum Development Grant, “Integrating Electronics, Robotics, and Intro Computer Science”, with S. Mohring and D. Musicant
- 2014 Broadening the Bridge Grant (Carleton-St Olaf Mellon-funded initiative), “Exploring opportunities for departmental resonance in physics and astronomy,” with B. Borovsky of St. Olaf.
- Carleton College Curriculum Innovation Grant, “Combining computation and experimentation to visualize physical systems,” with B. Titus and M. Baylor.
- Carleton College HHMI Course Development Grant, “Expanding community partner networks around energy and materials life cycle issues.”
- 2013 Carleton College HHMI Course Development Grant, “Connecting CS and physics through computer microarchitecture”, with S. Goings.
- 2009 Carleton College HHMI Course Development Grant, “Modeling and measuring materials’ properties in introductory physics.”
- 2008-09 Carleton College Large Faculty Development Grant – Eugster and Class of ’49 Fellowships
- 2004-05 University of Minnesota Doctoral Dissertation Fellowship
- 1999-00 University of Minnesota First-year Graduate School Fellowship
- 1999 Smith College Phi Beta Kappa; Smith College Sigma Xi

WORKSHOP FACILITATION & INVITED FACULTY DEVELOPMENT PRESENTATIONS

External to Carleton College

- 2025 Institutional Approaches to Quantitative Skills Support (co-facilitated with L. Muller) – For Associated Colleges of the Midwest institutions, Carleton College
- 2024 Using an ecosystem framework to support practitioners in changing the institutional quantitative skills support landscape (co-facilitated with L. Muller) - AAC&U Transforming STEM Education Conference, Washington DC
- The quantitative & symbolic reasoning requirement (co-facilitated with L. Muller) – Hamilton College
- 2023 Colleagues in Conversation: Preparing faculty for peer observation of teaching (co-facilitated with K. Elliot, L. Epstein) – POD Network Conference Workshop-in-a-box, Pittsburgh, PA
- The Art of Collaboration (co-facilitated with R. Poproski, M. Trevett-Smith) – POD Network Institute for New Educational Developers, Nevada State University
- Effective Practices in Peer Observation of Teaching (co-facilitated with M. Iommi) – POD Network Institute for New Educational Developers, Nevada State University
- Supporting STEM Faculty: Stereotypes and Surprises – POD Network Institute for New Educational Developers, Nevada State University
- 2022 Peer Observation of Teaching – ACM Faculty Teaching Fellows (co-facilitated with K. Elliot, L. Epstein, V. Morse)
- Reflecting on confusion, collaboration, and cognition in the science classroom – SUNY Plattsburgh (online)
- 2021 TILT assignments to support the success of students from diverse backgrounds – Denison University (online)
- Looking Forward: What are the ‘Keepers’ from Online and Hybrid Teaching – Lewis & Clark College Teaching Excellence Program (online)
- Effective Practices in Peer Evaluation of Teaching – Hamilton College (online)
- 2020 Engagement as a crucial element of resilient course design – Trinity College (CT) (online)

- Resilient course design that fosters engagement and builds community – College of St Benedict/St John’s University (online)
- Workshop series: Resilient course design: Design your course once for multiple scenarios, Resilient course design: Building community even in an online environment, Resilient course design: Assignments, assessment, & feedback – Wesleyan University (online)
- Designing Your Course Once for Multiple Modalities – ACM Online Course Design & Pedagogies Workshop Series (co-facilitated with V. Morse and D. Steen Fatkin) (online)
- Building Community in Online Environments – Claremont Colleges Center for Teaching & Learning webinar
- Building Community with Students When They’re Off Campus - Lessons from Carleton’s Online Summer CUBE – LACOL 2020 Virtual Workshop (online)
- 2019 Faculty Development and Student Learning: Sustaining a faculty culture that highly values teaching – COFHE Assembly Meeting, Williams College (panelist with B. Nagel and F. Rogers)
- Online Modules for Quantitative Skill Building – LACOL QLAB round robin conversations & workshops (co-facilitated with J. Leamon, L. Muller, S. Richard)
- 2015 Communicating physics in and beyond the laboratory – Teaching scientists how to communicate effectively – Amherst College

PRESENTATIONS (* indicates presenter; _ indicates Carleton College undergraduate)

- 2025 Contributed talk, S Kimbrell* & M Eblen-Zayas, “Encouraging students to critically engage with AI-generated problems and solutions in introductory mechanics”, 2025 AAPT Winter Meeting, St. Louis, MO
- 2024 Contributed poster, L Muller* & M Eblen-Zayas*, “Quantitative skill support ecosystem model for aligning institutional change efforts”, 2024 IUSE Summit, Washington DC
- Invited talk, “Confusion, collaboration, and cognition in the physics classroom”, University of Minnesota Duluth Physics Colloquium
- 2023 Invited discussant as part of ASCN Change Theories in Practice Discussion Series, Fall 2023
- With L Muller, “What we wish we had known: reflections on leading grassroots change efforts”
- With G Bangera, L Muller, and T Andrews, “When things don’t go as planned...what happens then?: Panel on change leadership and change theory”
- Contributed talk, M. Eblen-Zayas*, L. Muller*, “A Case Study of How STEM Education Practitioners Think about Change Theory, Change Strategies, and Making Relevant Project Choices”, 2023 Transforming Institutions Conference, Minneapolis, MN
- Contributed poster, L. Muller*, M. Eblen-Zayas*, “Fostering inter-institutional learning to understand quantitative skills support ecosystems,” 2023 Transforming Institutions Conference, Minneapolis, MN
- 2022 Facilitated discussion, Laura Muller*, Melissa Eblen-Zayas*, Lin Winton*, Jonathan Leamon, “Models for engaging faculty and staff on cross-institutional projects”, AAC&U Transforming STEM Education Conference, Alexandria, VA
- Contributed poster, M. Eblen-Zayas*, Laura Muller*, Jonathan Leamon*, Sundi Richard, Ellen Altermatt, Kristin O’Connell, “Faculty impressions of multidisciplinary online modules for quantitative skills review”, AAC&U Transforming STEM Education Conference, Alexandria, VA
- 2021 Contributed poster, Melissa Eblen-Zayas*, Janet Russell, “Students Who Thrived: Pandemic Lessons for Sustaining Student Well-being,” ISSOTL 2021 (online)
- Contributed talk, Melissa Eblen-Zayas*, Laura Muller, “Educational technology to support DEI at course and institutional levels”, AAPT Summer Meeting (online)
- Facilitated discussion, Melissa Eblen-Zayas*, Laura Muller*, J. Leamon, S. Richard, E. Altermatt, E. Iverson, K. O’Connell, “How faculty support student quantitative skills development in online environments,” National Numeracy Network Conference (online)
- Invited talk, “Phase inhomogeneity in EuO_{1-x} ”, Bard College physics colloquium
- 2020 Innovation/Ideation Session, Melissa Eblen-Zayas*, Laura Muller*, “Supporting student quantitative skills in online environments,” AAC&U Transforming STEM Conference (online)
- Contributed poster, M. Eblen-Zayas*, E. Altermatt, L. Muller, J. Leamon, S. Richard, “Supporting student quantitative skills across introductory STEM courses: Faculty approaches and perceived needs,” 1.E2, Physics Education Research Conference (online, paper published in proceedings)

- Invited talk, "Phase inhomogeneity in EuO_{1-x} ", APS Midwest Conference for Undergraduate Women in Physics, University of Minnesota
- 2019 Invited talk, "An evolving approach to assessment in upper-level labs," AAPT Summer Meeting, Provo, UT
- 2018 Invited talk, "Experimental design in curricular labs", Conference on Laboratory Instruction Beyond the First Year of College (BFY III Conference), Baltimore, MD
- Contributed poster, R. Terrien* & M. Eblen-Zayas, "Lessons learned from five years of student self-directed experimental projects in the advanced lab", BFY III Conference, Baltimore, MD
- Panelist (with C. Topaz & E. Stevens), "Teaching online in the liberal arts", LACOL Workshop, Carleton College
- 2017 Contributed talk, M. Eblen-Zayas* & J. Russell*, "Online in Summer and Face-to-Face in Fall: An Experimental Bridge Course for Quantitative Skills," Blended Learning in the Liberal Arts Conference, Bryn Mawr College, PA
- Invited talk, "Redesigning an advanced lab course to promote experimental design," APS March Meeting, New Orleans, LA, B40.00002
- Also at University of Minnesota Physics Education Seminar, Minneapolis, MN
- Discussion circle (with E. Evans, J. Russell, S. Taylor), "LACOL: A Consortium of Liberal Arts College Experimenting with Online Learning," EDUCAUSE ELI Annual Meeting, Houston, TX
- Invited talk, "Correlated electron materials: the fun begins when the models break down", College of St Scholastica School of Sciences Seminar
- Invited talk, "Phase inhomogeneity in EuO_{1-x} ", Williams College physics colloquium
- 2016 Invited talk, M. Eblen-Zayas* & J. Russell, "A Look into CUBE: Carleton Undergraduate Bridge Experience," LACOL webinar (online)
- Contributed poster, "The impact of metacognitive activities on student attitudes towards experimental physics," Physics Education Research Conference, Sacramento, CA (Paper published in proceedings.)
- Invited talk, "Designing Lab Experiences that Build Experimental Design Skills," AAPT Winter Meeting, New Orleans, LA
- Also at Physics Education Research Group, University of Colorado, Boulder (online)
- 2015 LEAP Session, M. Eblen-Zayas*, D. Gross*, & D. Walser-Kuntz*, "Civic Engagement Models to Foster Integrative Science Education," AAC&U Transforming STEM Education Conference, Seattle, WA
- Contributed poster, M. Eblen-Zayas* & M. Larson*, "Making meaningful curricular connections to campus operations and community initiatives," AASHE Conference, Minneapolis, MN
- Contributed poster, "Comparing electronic and traditional lab notebooks in the advanced lab," Conference on Laboratory Instruction Beyond the First Year of College (BFY II Conference), College Park, MD, (Paper published in proceedings.)
- Panelist (with H. Lewandowski & R. Tagg), "Implementing AAPT Recommendations for the Undergraduate Physics Lab," BFY II Conference, College Park, MD
- Invited talk, "Eu-rich EuO and the manganites: How similar?" Kent State University Physics Department Colloquium, Kent, OH
- 2014 Contributed poster, "Engaging physics majors with academic civic engagement projects," AAPT Summer Meeting, Minneapolis, MN
- Panelist, "Preparing students for quantitative reasoning" LACOL Workshop, Pomona College, Claremont, CA
- Contributed poster, B. Goodge*, L. Hellwig*, M. Eblen-Zayas, "Transport and magnetoresistance response of EuO_{1-x} films fabricated by two different methods," APS March Meeting, Denver, CO, C1.00080
- 2013 Contributed talk, "Development of a materials science course to serve diverse constituencies," ASEE Annual Conference, Atlanta, GA (Paper published in proceedings.)
- Invited talk, "Rethinking assessment in upper-level lab courses," University of Minnesota Physics Education Seminar, Minneapolis, MN
- Also at University of St Thomas Physics Department, St Paul, MN
- Contributed poster, L. Hellwig*, C. Beckner*, M. Eblen-Zayas, "The colossal magnetoresistance response of EuO_{1-x} thin films," APS March Meeting, Baltimore, MD, V1.00132
- 2012 Contributed talk, "Hands-on performance assessments for electronics," AAPT Summer Meeting, Philadelphia, PA
- Contributed poster, "Emphasizing oral communication skills in an upper-level electronics course," Conference on Laboratory Instruction Beyond the First Year of College, Philadelphia
- 2011 Contributed poster, B. Colwell*, A. Kinsey*, S. Schlotter*, M. Eblen-Zayas, "Characterization of EuO_{1-x} thin films grown by oxidation of metallic Eu," APS March Meeting, Dallas, TX, K1.193

- 2010 Contributed talk, S. Schlotter^{*}, T. Brenner, C. Carter, B. Colwell, A. Kinsey, B. Schuster, M. Eblen-Zayas, "Magnetic and transport properties of EuO films fabricated by oxidation of Eu metal films," APS March Meeting, Portland, OR, P37.00002
Contributed poster, M. Eblen-Zayas^{*}, T. Brenner, B. Colwell, C. Carter, B. Schuster, S. Schlotter, "Impact of substrate heating during growth on transport and magnetization response of Eu-rich EuO thin films," Joint MMM/Intermag Conference, Washington, DC, ER-15
Contributed talk, "Integrating novel writing assignments in intermediate physics courses," MAAPT/WAPT Fall Meeting, UW River Falls, River Falls, WI
- 2009 Invited talk, "Eu-rich EuO as a laboratory for exploring colossal magnetoresistance" Williams College physics colloquium
Also at Macalester College physics colloquium & St. Olaf College physics colloquium
Invited talk, "Transport and magnetotransport in Eu-rich EuO thin films," University of Minnesota condensed matter seminar
Contributed poster, T. Brenner^{*}, M. Eblen-Zayas, "Growth and characterization of EuO thin films," APS March Meeting, Pittsburgh, PA, K1.129
Panelist, Discussion of introductory physics labs, MAAPT Fall Meeting, Augsburg College, Minneapolis, MN
Contributed poster, M. Eblen-Zayas^{*} & D. Luhman^{*}, "Intermediate and Advanced Labs at Carleton College," APS/AAPT Topical Conference on Advanced Labs, Ann Arbor, MI
Contributed talk, "Applying New Faculty Workshop Lessons Learned to Intermediate-Level Physics Courses", APS March Meeting, Pittsburgh, PA, D29.12
- 2008 Invited talk, "Eu-rich EuO as a laboratory for exploring colossal magnetoresistance", University of Northern Iowa physics colloquium
Contributed talk, Pinshane Huang^{*}, Tom Brenner^{*}, M. Eblen-Zayas, "Hands-on Green Physics: Making your own biodegradable plastics and dye-sensitized solar cells," MAAPT Spring Meeting, Macalester College
- 2006 Invited talk, "CMR responses: Nanoscale inhomogeneity and colossal responses" St. Olaf Physics Colloquium, Northfield, MN
Also at Smith College Physics Lunch, Northampton, MA
Invited talk, "Electrical modulation of colossal magnetoresistive materials" Amherst College Physics Colloquium, Amherst, MA
Contributed talk, "Small steps towards incorporating nano concepts in the undergraduate physics curriculum," 2nd NCLT Faculty Workshop on Nanoscale Science & Engineering Education, Cal Poly San Luis Obispo, CA
Contributed talk, "Networking and mentoring women in physics: Local approaches to a universal challenge", MAAPT Spring meeting, Hamline University, St. Paul, MN
- 2005 Invited talk, "Low temperature response of ultrathin manganite films in a field-effect geometry" Argonne National Laboratory Materials Science Division, Argonne, IL
Also at Dartmouth College Quantum/Nanophysics Seminar, Hanover, NH
Contributed poster, M. Eblen-Zayas^{*}, A. Bhattacharya, N.E. Staley, A.L. Kobrinskii, A.M. Goldman, "Low temperature response of ultrathin manganite films in a FET geometry," 2nd IUPAP International Conference on Women in Physics, Rio de Janeiro, Brazil
Contributed talk, M. Eblen-Zayas^{*}, A. Bhattacharya, N.E. Staley, A.L. Kobrinskii, A.M. Goldman, "Glassy response to gate and magnetic fields in ultrathin manganite films," APS March Meeting, Los Angeles, CA, J41.004
- 2004 Invited talk, "Low temperature response of ultrathin manganite films in a field-effect geometry," Materials Physics Branch, Naval Research Labs, Washington, DC
Contributed talk, M. Eblen-Zayas^{*}, A. Bhattacharya, N.E. Staley, A.L. Kobrinskii, A.M. Goldman, "Ultrathin manganites in FET geometry: device fabrication and characterization," APS March Meeting, Montreal, Canada, Y24.002
- 2003 Invited talk, "Electrostatic Modulation of the Superconductor-Insulator Transition", St. Olaf College Physics Department Colloquium
Contributed talk, M. Eblen-Zayas^{*}, A. Bhattacharya, N.E. Staley, "Breakdown studies of single crystal SrTiO₃ and sputtered Al₂O₃," APS March Meeting, Austin, Texas, X25.008
- 1999 Contributed talk, M. Eblen^{*}, N. Fortune, M. Naughton, "Comparative Calorimetric Study of Spin-Density-Wave Transitions in (TMTSF)₂PF₆ and (TMTSF)₂ClO₄" APS Centennial Meeting, Atlanta, Georgia, QC01.05

PROFESSIONAL COMMUNITY INVOLVEMENT

Service to American Association of Physics Teachers (AAPT), American Physical Society (APS):

Effective Practices for Physics Programs (EP3) Editorial Board	2024-2027
Chair-Elect (2025)	
APS Committee on Education	2025-2027
Elected APS/AAPT Member-at-large, APS Forum on Education Executive Committee	2021-2023
Reviewer for "Introductory Courses for STEM Majors" in "A Guide to Effective Practices for Physics Programs (EP3)", S. McKagan, D.A. Craig, M. Jackson, and T. Hodapp, Eds., (American Physical Society, College Park, MD, Version 2021.1)	2021
Committee for the <i>American Journal of Physics</i> Five-Year Review	2019-2020
Minnesota AAPT Chapter President	2016-2018
Minnesota AAPT Chapter Vice-President	2014-2016
Reviewer, APS & AAPT Joint Task Force on Undergraduate Physics Programs, <i>Phys21: Preparing Physics Students for 21st Century Careers</i>	2016
AAPT Committee on Laboratories	2013-2016
Selection Committee, APS Reichert Award for Advanced Lab Instruction	2013-2014
Minnesota AAPT Chapter Treasurer	2006-2014
AAPT Committee on Graduate Education	2006-2009

External reviewer:

Physics program/department reviews at Loyola University (New Orleans, LA),
 Marquette University (Milwaukee, WI), Nebraska Wesleyan University (Lincoln, NE),
 Reed College (Portland, OR), Simpson College (Indianola, IA), Smith College
 (Northampton, MA), Wellesley College (Wellesley, MA), Ursinus College (Collegeville, PA)
 Center for Learning and Teaching review, Denison University (Granville, OH)
 Reviewer for promotion and tenure files at nine different liberal arts colleges
 NSF panel reviewer for Division of Undergraduate Education

Additional professional involvement and professional development:

Science consulting team, Sherman Fairchild Foundation	2017-present
Measurement, Evaluation, Statistics, & Assessment Certificate, Univ. of Illinois-Chicago	2024-2025
Scholarship Reimagined: A SoTL Program for ACM Faculty and Staff	2024
Playlab.ai Professional Learning Community (Prompt Engineering Microcredential)	2024
HERS Leadership Institute	2023
POD Network Institute for New Educational Developers Faculty	2023
AAC&U Teaching to Increase Diversity & Equity in STEM (TIDES) Institute	2021
Organizing Committee, Conference on Laboratory Instruction Beyond the First Year of College (BFY III)	2017-2018
Editor, BFY III Conference Proceedings	2018
Organizing Committee, LACOL QS/QR Hack-a-thon	2016-2017
Organizing Committee, Conference on Laboratory Instruction Beyond the First Year of College (BFY II)	2014-2015
Editor, BFY II Conference Proceedings	2015
PKAL Summer Leadership Institute for STEM Faculty	2011
US delegation to 2 nd IUPAP International Conference on Women in Physics	2005

INSTITUTIONAL INVOLVEMENT at Carleton College

Administrative roles:

Director, Perlman Center for Learning and Teaching	2016-2020
Director, Carleton Undergraduate Bridge Experience (CUBE)	2016-2019
Department Chair, Physics & Astronomy	2012-2016
Coordinator, Science Fellows Program	2011-2014

College-wide committees:

Education and Curriculum Committee	2022-2024
Community, Equity, Diversity, Inclusion Leadership Board	2021-2024
Faculty co-chair	2022-2024
Future Learning Technology Group	2013-2017
Faculty Personnel Committee	2014-2016
Budget Committee	2010-2012
Budget Committee Representative to Faculty Compensation Committee	2010-2012
Junior Faculty Affairs Committee	2009-2010
Institutional Animal Care and Use Committee	2007-2008
Learning and Teaching Center Advisory Board	2006-2008

Additional campus involvement:

STEM Board	2021-2024
Strategic Planning Community Advisor: Community of Belonging Task Force	2022-2023
Faculty Working Group: Student Sampling Procedures	2019-2020
Public Works Grant Committee (Mellon-funded grant initiative)	2017-2020
Maker Space Planning Group	2017-2018
Environmental Studies Steering Committee	2015-2018
Civic Engagement Advisory Board	2016-2017
Science Facilities Planning Group	2014-2016
Science and Math Steering Committee (formerly CISMI, now STEM Board)	2006-2016
Facilities Master Planning – Science and Math Facilities Subcommittee	2013-2014
Environmental Studies Curriculum Committee	2011-2014
Strategic Planning Working Group: Faculty and Staff Compensation	2011-2012
Clare Booth Luce Scholars Coordinator	2011-2012

Faculty development facilitation:

Co-Director, President’s Mid-career Faculty Leadership Fellows Program	2024-present
Workshop organizer/facilitator:	
What Does Compassionate Challenge Look Like for the Various Roles You Have?	2024
Discussion series: Pedagogical Wellness	2024
Colleagues in Conversation: Effective Practices for Peer Observation of Teaching	2023
On-ramping Students for Success Workshop	2021
New Faculty Workshop	2016-2019
Active Learning Spaces Workshop	2019
Effective & Efficient Feedback Workshop	2018
Inclusive Classrooms Faculty Learning Community	2017
Book group facilitator:	
Cavanagh, <i>Mind Over Monsters: Supporting Youth Mental Health...</i>	2024
Eaton et al., <i>Improving Learning and Mental Health in the College Classroom</i>	2023
Stewart & Valian, <i>An Inclusive Academy: Achieving Diversity & Excellence</i>	2019
Gazzaley & Rosen, <i>The Distracted Mind: Ancient Brains in a High-Tech World</i>	2019
Ross, <i>Everyday Bias: Identifying and Navigating Judgments in our Daily Lives</i>	2017
Massé & Hogan, <i>Over Ten Million Served: Gendered Service...</i>	2013
New faculty mentor	2011-13, 2021-22

PROFESSIONAL MEMBERSHIPS

American Physical Society, American Association of Physics Teachers, Council on Undergraduate Research, POD Network