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 research-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.

EDUCATIONAL DEVELOPMENT INTERESTS & EXPERIENCE

- Interests include: 1) Developing approaches to on ramp students for success when they arrive with varied levels of preparation for coursework and varied understanding of how to navigate college expectations and structures, and 2) Models of peer observation of teaching and the role of peer observation of teaching in the faculty development ecosystem.
- Conceptualized and led a multi-campus educational development pilot project for LACOL consortium that created a framework for developing online modules focused on quantitative skills (QS) and their applications, 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 for the use of online modules to support students' QS development and factors that impact faculty and departmental choices about QS support (2019-present).

- Proposed, designed, and developed the hybrid Carleton Undergraduate Bridge Experience (CUBE) beginning in 2016 to provide incoming first-year students the opportunity to review quantitative skills, explore their application to many disciplines, and create an early connection with the Carleton community. Taught CUBE from 2016-2019.

PUBLICATIONS

Forthcoming (accepted, but not yet in print)

2022 M. Eblen-Zayas, K. M. Burson, D. McDermott, "Course modifications to support student mental health and move towards UDL", Forthcoming in *The Physics Teacher* in fall 2022.

Melissa 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. Forthcoming from West Virginia University Press in November 2022.

Book chapters

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

2022 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

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

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

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

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

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 $La_{0.8}Ca_{0.2}MnO_3$ 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 $La_{0.8}Ca_{0.2}MnO_3$ 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-(BEDT-TTF)$_2$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/LabGuidlinesDocument_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

PRESENTATIONS – SoTL/Pedagogy/Curricular Design *(* indicates presenter)*

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)

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)

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

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
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
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
2012 Contributed talk, "Hands-on performance assessments for electronics," AAPT Summer Meeting, Philadelpha, PA
Contributed poster, "Emphasizing oral communication skills in an upper-level electronics course," Conference on Laboratory Instruction Beyond the First Year of College, Philadelphia
2010 Contributed talk, "Integrating novel writing assignments in intermediate physics courses," MAAPT/WAPT Fall Meeting, UW River Falls, River Falls, WI
2009 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
2006 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

PRESENTATIONS/WORKSHOPS – Faculty Development & Educational Development

*(* indicates presenter/facilitator)*

2022 Invited talk, "Reflecting on confusion, collaboration, and cognition in the science classroom", SUNY Plattsburgh (online)
2021 Interactive on-demand session, T. Bartholomew*, M. Eblen-Zayas*, L. Ludwig*, A. Montgomery*, "Leveraging lessons learned and relearned during COVID-19 for the future," POD Network Annual Conference 2021 (online)
Invited talk, "TILT assignments to support the success of students from diverse backgrounds", Denison University (online)
Online workshop, "Looking Forward: What are the 'Keepers' from Online and Hybrid Teaching", Lewis & Clark College Teaching Excellence Program
Invited talk, "Effective practices in peer evaluation of teaching," Hamilton College (online)
2020 Online workshop, "Engagement as a crucial element of resilient course design," Trinity College (CT)
Online workshop, "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 workshop, M. Eblen-Zayas*, V. Morse*, D. Steen Fatkin*, "Designing Your Course Once for Multiple Modalities," ACM Online Course Design & Pedagogies Workshop Series

Invited talk, "Building Community in Online Environments," Claremont Colleges Center for Teaching & Learning webinar
Online workshop, "Building Community with Students When They're Off Campus - Lessons from Carleton's Online Summer CUBE", LACOL 2020 Virtual Workshop
Invited talk, "Creating a High-Touch Online Summer Bridge Program," Academic Impressions webinar

2019 LACOL QLAB round robin conversations & workshops, M. Eblen-Zayas*, S. Richard*, L. Muller*, and J. Leamon*, programming that included over 75 social science and science faculty at Carleton, Davidson, and Williams Colleges in the development of prototype online modules to support student QS review and practice
Panelist (with B. Nagel & F. Rogers), "Faculty Development and Student Learning: Sustaining a faculty culture that highly values teaching", COFHE Assembly Meeting, Williams College

2018 Contributed poster, Celeste Sharpe*, Sarah Calhoun*, Melissa Eblen-Zayas, Iris Jastram, Kristin Partlo, Janet Russell*, "Perspectives on Connecting SoTL across the (Co-)Curriculum at a Small Liberal Arts College", ISSOTL18, Bergen, Norway

2017 Contributed poster, K. O'Connell* & M. Eblen-Zayas, "Making Connections: How a Small Learning and Teaching Center Has a Big Impact", NSEC Conference, New Orleans, LA

2015 Workshop, "Communicating physics in and beyond the laboratory," Telling it like it is: Teaching scientists how to communicate effectively, Amherst College, Amherst, MA

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

2021 Invited talk, "Phase inhomogeneity in EuO_{1-x}", Bard College physics colloquium

2020 Invited talk, "Phase inhomogeneity in EuO_{1-x}", APS Midwest Conference for Undergraduate Women in Physics, University of Minnesota

2017 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

2015 Invited talk, "Eu-rich EuO and the manganites: How similar?" Kent State University Physics Department Colloquium, Kent, OH

2014 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 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

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

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

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

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 $SrTiO_3$ and sputtered Al_2O_3," 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 $(TMTSF)_2PF_6$ and $(TMTSF)_2ClO_4$" APS Centennial Meeting, Atlanta, Georgia, QC01.05

GRANTS, FELLOWSHIPS, & AWARDS

External

2022-2023 Associated Colleges of the Midwest Faculty Career Enhancement (FaCE) Grant: "The Faculty 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.

2019-2023 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

2017-2018 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.

2010-2013 National Science Foundation Major Research Instrumentation MRI-R^2: "Acquisition of an x-ray diffractometer for powder and thin film materials characterization", PI: Melissa Eblen-Zays, Co-PIs: Cam Davidson & Steve Drew, Amount: $305,000.

2008-2013 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.

2007-2010 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.

2001-2004 National Science Foundation Graduate Research Fellowship

Institutional

2015 Carleton College HHMI Curriculum Development Grant, "Integrating Electronics, Robotics, and Intro Computer Science", with S. Mohring and D. Musicant

Minnesota Campus Compact Presidents' Civic Engagement Steward Award

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

PROFESSIONAL COMMUNITY INVOLVEMENT

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

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 *American Journal of Physics* 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, *Phys21: Preparing Physics Students for 21st Century Careers*	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 Marquette University (Milwaukee, WI), Nebraska Wesleyan University (Lincoln, NE), Wellesley College (Wellesley, MA), Simpson College (Indianola, IA), and Loyola University (New Orleans, LA)
Reviewer for tenure files at seven different liberal arts colleges

Additional professional involvement and professional development:

Science consulting team, Sherman Fairchild Foundation	2017-present
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 2nd IUPAP International Conference on Women in Physics	2005

INSTITUTIONAL INVOLVEMENT at Carleton College

Administrative roles:

Director, Perlman Center for Learning and Teaching	2016-2020
Department Chair, Physics & Astronomy	2012-2016
Coordinator, Science Fellows Program	2011-2014

College-wide committees:

Education and Curriculum Committee	2022-present

Community, Equity, Diversity, Inclusion Leadership Board	2021-present
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-present
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)	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:

Workshop organizer/facilitator:

Faculty Teaching Fellows Workshop on Peer Observation of Teaching	2022
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:

Stewart & Valian, *An Inclusive Academy: Achieving Diversity & Excellence*	2019
Gazzaley & Rosen, *The Distracted Mind: Ancient Brains in a High-Tech World*	2019
Ross, *Everyday Bias: Identifying and Navigating Judgments in our Daily Lives*	2017
Massé & Hogan, *Over Ten Million Served: Gendered Service…*	2013

New faculty mentor 2011-2013, 2021-

PROFESSIONAL MEMBERSHIPS

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