Patti C. Hamerski

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EXPERIENCE

Assistant Professor — 2023 – Present
Oregon State University — Corvallis, OR
Department of Physics

Assistant Professor, Fixed-Term — 2021 – 2023
Michigan State University — East Lansing, MI
Department of Computational Mathematics, Science and Engineering

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EDUCATION

Ph.D. in Physics (Physics Education Research) — 2017 – 2021
Michigan State University — East Lansing, MI
Department of Physics and Astronomy
Dissertation: "Centering students' perspectives in computation-integrated physics curricula"
Advisors: Daryl McPadden and Paul W. Irving

B.S. in Physics; B.S. in Mathematical Sciences; Minor in Computer Science — 2012 – 2016
Carnegie Mellon University — Pittsburgh, PA

PUBLICATIONS

P. Her and **P. C. Hamerski**. Investigating student perceptions of creativity and generative AI in computational physics. Proceedings of the 2024 Physics Education Research Conference (Boston, MA, 2024). 10.1119/perc.2024.pr.Her

P. C. Hamerski. Generative AI as a Resource for Creativity in Computational Physics. SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education (Portland, OR, 2024). 10.1145/3626253.3635595

D. W. Silvia, M. D. Caballero, T. Finzell, R. Frisbie, **P. C. Hamerski**, E. Bolger, S. Castle, R. Roca, and P. Tourangeau. Computing in Support of Disciplinary Learning. SIGCSE 2023: Proceedings of the 54th ACM Technical Symposium on Computer Science Education (Toronto, Canada, 2023). 10.1145/3545947.3573341

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving. Students' perspectives on computational challenges in physics class. Physical Review Physics Education Research 18, 020109 (2022). 10.1103/PhysRevPhysEducRes.18.020109

P. C. Hamerski, D. Silvia, and M. D. Caballero. Exploring Self-Efficacy in Data Science. ITiCSE 2022: Proceedings of the 27th ACM Conference on on Innovation and Technology in Computer Science Education (Dublin, Ireland, 2022).

M. Kubsch and **P. C. Hamerski**. Dynamic Energy Transfer Models, The Physics Teacher 60, 583 (2022). 10.1119/5.0037727

P. C. Hamerski, P. W. Irving, and D. McPadden. Learning assistants as student-partners in introductory physics. Physical Review Physics Education Research 17, 020107 (2021). 10.1103/PhysRevPhysEducRes.17.020107

J. N. Bumler, **P. C. Hamerski**, M. D. Caballero, and P. W. Irving. How do previous coding experiences influence undergraduate physics students? Proceedings of the 2019 Physics Education Research Conference (Provo, UT, 2019). 10.1119/perc.2019.pr.Bumler

P. C. Hamerski, P. W. Irving, and D. R. McPadden. Learning Assistants as constructors of feedback: How are they impacted? Proceedings of the 2018 Physics Education Research Conference (Washington, DC, 2018). 10.1119/perc.2018.pr.Hamerski

D. R. McPadden, **P. C. Hamerski**, M. D. Caballero, and P. W. Irving. Feedback as a mechanism for improving students' communication skills. Proceedings of the 2018 Physics Education Research Conference (Washington, DC, 2018). 10.1119/perc.2018.pr.McPadden

INVITED PRESENTATIONS

P. C. Hamerski. Factors of Student Success in Computing and Physics (February, 2024). Invited talk presented as Michigan State University PER Seminar. East Lansing, MI.

CONTRIBUTED PRESENTATIONS

P. Her and **P. C. Hamerski**. Investigating student perceptions of creativity and generative AI in computational physics (July 2024). Contributed posters presented at the AAPT 2024 Summer Meeting and PERC 2024. Boston, MA.

L. Nearhood and **P. C. Hamerski**. Computing the tension: An activity theoretic analysis of a computational physics lab (July 2024). Contributed posters presented at the AAPT 2024 Summer Meeting and PERC 2024. Boston, MA.

P. C. Hamerski. Generative AI as a Resource for Creativity in Computational Physics (March 2024). Contributed poster presented at SIGCSE 2024. Portland, OR.

P. C. Hamerski. Factors of Student Success in Computing and Physics (October 2023). Contributed talk presented at Oregon AAPT 2023 Fall Meeting. Bend, OR.

D. W. Silvia, M. D. Caballero, T. Finzell, R. Frisbie, **P. C. Hamerski**, E. Bolger, S. Castle, R. Roca, and P. Tourangeau (March 2023). Computing in Support of Disciplinary Learning. Birds of a Feather session delivered at SIGCSE 2023. Toronto, Canada.

P. C. Hamerski, D. Silvia, and M. D. Caballero (July 2022). Exploring Self-Efficacy in Data Science. Contributed poster presented at ITiCSE 2022. Dublin, Ireland.

P. C. Hamerski (June 2022). Exploring Self-Efficacy in Introductory Computational Science. Contributed talk presented at the Oslo PER Summer Institute. Oslo, Norway.

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (March 2022). Dispositions and mindset in computation-integrated physics. Contributed poster presented at the AERA 2022 Annual Meeting. San Diego, CA.

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (July 2021). Dispositions and mindset in computation-integrated physics. Contributed poster presented at PERC 2021. (Virtual Conference)

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (April 2021). "What's the Point?" Student Perspectives on Computation in Physics Class. Contributed poster presented at the AERA 2021 Summer Meeting. (Virtual Conference)

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (April 2021). What's the Point? Student Perspectives on Computation in Physics Class. Contributed poster presented at NARST 2021. (Virtual Conference)

P. C. Hamerski, P. W. Irving, and D. McPadden (July 2020). Formative feedback mechanism shaped by Learning Assistants. Juried talk presented at PERC 2020. (Virtual Conference)

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (July 2020). Case study on the computational experiences of high school physics students. Contributed talk presented at the AAPT 2020 Summer Meeting. (Virtual Conference)

P. C. Hamerski, M. D. Caballero, and P. W. Irving (April 2020). Multisited comparison of computational physics identity development for high school students [Structured Poster Session]. AERA 2020 Annual Meeting. San Francisco, CA. (Conference Canceled)

P. C. Hamerski, D. McPadden, and P. W. Irving (October 2019). A formative feedback mechanism shaped by Learning Assistants. Contributed talk presented at the Learning Assistant Research Symposium. Boulder, CO.

P. C. Hamerski, D. McPadden, M. D. Caballero, and P. W. Irving (July 2019). The figured world of a high school physics class with integrated computation. Contributed talk and poster presented at the AAPT 2019 Summer Meeting. Contributed poster presented at PERC 2019. Provo, UT.

J. N. Bumler, **P. C. Hamerski**, M. D. Caballero, and P. W. Irving (July 2019). How do previous coding experiences influence undergraduate physics students? Contributed talk and poster presented at the AAPT 2019 Summer Meeting. Contributed poster presented at PERC 2019. Provo, UT.

P. C. Hamerski, P. W. Irving and D. McPadden (October 2018). Learning assistants as constructors of feedback: How are they impacted? Contributed talk presented at the Michigan AAPT 2018 Fall Meeting. Interlochen, MI.

P. C. Hamerski, P. W. Irving and D. McPadden (September 2018). Learning assistants as construc-

tors of feedback: How are they impacted? Contributed poster presented at the STEM Education Alliance fall reception. East Lansing, MI.

P. C. Hamerski, P. W. Irving, and D. McPadden (July 2018). Learning Assistants as constructors of feedback: How are they impacted? Contributed talk and poster presented at the AAPT 2018 Summer Meeting. Contributed poster presented at PERC 2018. Washington, DC.

D. McPadden, **P. C. Hamerski**, M. D. Caballero, and P. W. Irving (July 2018). Feedback as a mechanism for improving students' communication skills. Contributed poster presented at PERC 2018. Washington, DC.

D. McPadden, **P. C. Hamerski**, M. D. Caballero, and P. W. Irving (July 2018). Students' experiences with skills progressions in EMP-Cubed. Contributed talk presented at the AAPT 2018 Summer Meeting. Washington, DC.

P. C. Hamerski, D. McPadden, P. W. Irving, and M. D. Caballero (March 2018). Progression of Student Feedback and Computational Skills in P-Cubed. Contributed talk presented at the joint meeting of the Ohio-Region APS and the Michigan AAPT. East Lansing, MI.

P. C. Hamerski, P. W. Irving, and M. D. Caballero (July 2016). Exploring the role of design problems in the physics classroom. Contributed posters presented at the AAPT 2016 Summer Meeting and PERC 2016. Sacramento, CA.

AWARDS AND HONORS

STEM Teaching & Learning Fellow — 2022 – 2023
Michigan State University

Physical Review Physics Education Research Editor's Suggestion — 2022
Article: "Students' perspectives on computational challenges in physics class"

Bailey Scholars Program Graduate Fellow — 2019 – 2020
Michigan State University

Excellence-in-Teaching Citation — 2019
Michigan State University
College of Natural Science

Outstanding Graduate Teaching Assistant Award — 2018
Michigan State University
Department of Physics and Astronomy

Phi Beta Kappa Society — 2016
Carnegie Mellon University

TEACHING

Oregon State University

PH 403: Thesis	Winter 2025 Fall 2024
PH 366: Computational Physics Lab II	Winter 2025 Winter 2024
PH 365: Computational Physics Lab I	Fall 2024 Fall 2023
PH 367: Computational Physics Lab III	Spring 2024

Michigan State University

CMSE 201: Introduction to Computational Modeling and Data Analysis	Spring 2023 Fall 2022 Fall 2021
STT/CMSE 180: Introduction to Data Science Lead faculty instructor for multi-section course	Spring 2023 Spring 2022
ANR 410: Integrated Learning Transitions	Spring 2020
ANR 210: Pathways in Integrated Learning	Fall 2019
PHY 184: Physics for Scientists and Engineers II	Spring 2019

Section: Electricity and Magnetism Projects & Practices in Physics — Fall 2018, Spring 2018, Fall 2017

PROJECTS

Generative AI in Computational Physics 2023 – Present
Oregon State University
- Leading an NSF-funded project, Generative Artificial Intelligence as Creative Practice in Computational Physics Education
- Planned integration of generative AI (gen-AI)-based activities into computational physics courses and designed research to investigate how gen-AI can be used strategically to promote creativity
- Mentoring graduate student researcher Pachi Her on curriculum development, research design, and qualitative research methods

Transfer Advocacy Alliance for Physics Success 2024 – Present
Oregon State University
- Conducted interviews with undergraduate physics transfer students to build understanding of a diverse set of transfer-based challenges
- Formed a working group and initiated meetings of the Transfer Advocacy Alliance for Physics Success (TAAPS), a group of faculty and undergraduate transfer students in the OSU physics department committed to improving support for transfer experiences
- Negotiated shared vision with TAAPS group for improving departmental culture and streamlining flow of information to transfer students considering physics at OSU
- Continuing to work with TAAPS to build out plan for institutional change

Transgender STEM Graduate Student Experiences 2024 – Present
Oregon State University
- Collaborated with Finn Johnson from the Women, Gender, and Sexuality Studies Program at OSU to plan project for multi-sited ethnographic study of the national landscape of transgender STEM graduate student experiences
- Planning local research on the experiences of transgender STEM graduate students at OSU

Computational Science Self-efficacy 2021 – 2023
Michigan State University
- Collaborated as a member of the Computation Education Research Lab in the Department of Computational Mathematics, Science and Engineering (CMSE)
- Designed a research study on characterizing computational science self-efficacy for students in

an introductory CMSE course
- Conducted research interviews, carried out theory-driven and data-driven coding for self-efficacy, developed a codebook, and crafted findings from students' experiences

Integrating Computation in Science Across Michigan 2018 – 2021
Michigan State University and high schools throughout Michigan
- Carried out research and facilitated teacher professional development as a member of an NSF-funded project, Integrating Computation in Science Across Michigan (ICSAM)
- Recruited teachers for professional development around integrating computing into physics, supported teacher efforts during the academic year, and ran data collection for related research projects
- Co-designed and facilitated ICSAM workshops to help teachers create and share computational physics curricular materials and address equity imbalances using data collected from their classrooms
- Carried out my own research agenda on building qualitative case studies of the perspectives of high school students who were learning newly implemented computing-integrated physics content in their courses

Learning Assistant Partnerships 2018 – 2020
Michigan State University
- Carried out a research project for a graduate-level physics education research course and expanded it into a larger qualitative study
- Interviewed Learning Assistants (LAs) in physics about how their teaching role impacted their professional development and group work skills in other contexts
- Expanded the project into a case study on the partnership-like nature of being an LA, collecting additional data from a faculty member interview, email correspondences with LAs, and teaching artifacts
- Disseminated findings and implications, which spanned different ways to leverage LA expertise through their partnerships across the broader teaching staff and their membership within the course community.

CURRICULUM DEVELOPMENT

Computational Physics Courses 2023 – Present
Oregon State University
- Aligned learning objectives of computational physics labs with best practices in disciplinary computing and relevant content in simultaneously offered junior-level physics courses
- Updated all course activities and wrote several in-class assignments and instructor solution

guides from scratch to meet the needs of re-aligned learning objectives and fill in missing materials
- Developing new course on computational modeling in physics to support physic curricular changes to increase the computational offerings of the undergraduate physics program

Careers in Physics and Thesis Writing 2024 – Present
Oregon State University
- Redesigned syllabi and course schedules to convert physics thesis writing course sequence into one career engagement writing course and a shorter sequence of thesis writing courses
- Developing content for new course on career engagement and updated courses on thesis writing

Difference, Power, and Oppression 2024 – Present
Oregon State University
- Attended workshops from OSU's Difference, Power, and Oppression (DPO) Program to learn how to develop inclusive curriculum that addresses institutionalized systems of power, privilege, and inequity, both broadly and within the physics discipline
- Co-developed new course from scratch with a physics colleague to meet need for a course that addresses DPO within the field of physics
- Designed course around best practices in inclusive curriculum development, including citational justice, Universal Design for Learning, and labor-based grading
- Developing finer grain day-to-day course materials in an ongoing collaborative manner

STEM Teaching & Learning Fellowship 2022 – 2023
Michigan State University
- Joined the STEM Teaching & Learning Fellowship team, a group of faculty curriculum developers in STEM departments supported by an NSF-funded project, Extending A Coherent Gateway to STEM Teaching and Learning
- Learned backwards design as a tool to promote and structure three-dimensional learning in scientific disciplines
- Collaborated with other faculty fellows to redesign introductory computational modeling and data science assignments where students learn to clean dirty data and use compartmental modeling to explore relationships between differential equations

Introductory Computational Science Courses 2021 – 2023
Michigan State University
- Taught and developed curriculum in the Department of Computational Mathematics, Science and Engineering (CMSE)'s introductory computational science courses
- Updated instructor solution guides to incorporate facilitation questions and strategies, rewrote out-of-date in-class project assignments, and recorded a lecture series for an introductory data science course
- Incorporated activities and discussions on data justice into multiple CMSE courses

Liberty Hyde Bailey Scholars Program 2019 – 2020
Michigan State University
- Joined the Liberty Hyde Bailey Scholars Program community as a graduate fellow course convener, meaning co-instructor for Bailey courses, which students took as part of earning a minor in Leadership in Integrated Learning
- Co-led in-class curriculum development together with another graduate fellow and students by facilitating discussions and enabling students share their interests and passions by planning class periods and constructing co-learning opportunities
- Co-organized course activities with students and guided their development of curricular agency and leadership among their peers
- Participated in community activities hosted by students in the Bailey community space

Electricity and Magnetism Projects & Practices in Physics 2017 – 2019
Michigan State University
- Helped develop materials for Electricity and Magnetism Projects & Practices in Physics (EMP-Cubed), a flipped course that incorporates VPython computational problems into introductory physics
- Co-planned the development of weekly notes and video lectures, pre-/post-class homework sets, weekly in-class projects, and instructor solution guides
- Created in-class projects, solution guides, and example problems to accompany the weekly notes

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RESEARCH MENTORSHIP

Oregon State University

Graduate Students
Pachi Her — Winter 2024 – Present
Luke Nearhood — Fall 2023 – Present

Undergraduate Students
Mateo Hall — Winter 2025 – Present

Michigan State University

Undergraduate Students
Paige Tourangeau — Spring 2022 – Summer 2023
Jacob Rodgers — Summer 2022 – Spring 2023
Jacqueline N. Bumler — Spring 2019 – Fall 2019

PROFESSIONAL SERVICE

Department Service

Diversity, Inclusion, Climate, and Equity Committee (Chair)	Fall 2024 – Present
Core Advising Committee	Fall 2024 – Present
Physicists for Inclusion Faculty Advisor	Fall 2024 – Present
Promotion and Tenure Committee	Fall 2024 – Present
Upper Division Curriculum Committee	Fall 2023 – Present
Graduate Curriculum Committee	Fall 2023 – Present
Graduate Admissions Committee	Fall 2024 – Winter 2024

Panel Reviewing

National Science Foundation	2024

Journal Reviewing

Journal for STEM Education Research	2023
Physical Review Physics Education Research	2021 – 2023
Computer Science Education	2022
The Physics Teacher	2021 – 2022

Conference Reviewing

Physics Education Research Conference	2018 – 2019, 2024
Technical Symposium on Computer Science Education	2022
National Association for Research in Science Teaching	2020 – 2021
Learning Assistant Research Symposium	2019

Professional Memberships

American Physical Society	2024 – Present
Association for Computing Machinery	2022 – Present
American Association of Physics Teachers	2016 – 2021, 2024 – Present
American Educational Research Association	2019 – 2022

PUBLIC OUTREACH

Presenter 2021
"The Physics of Javelin"
Michigan Science Festival

Mentor and Co-organizer 2020
TARDIS High School Outreach Program
Michigan State University and East Lansing High School

Volunteer 2018 – 2019
Physics and Astronomy Day
Impression 5 Science Center
Lansing, MI