

Madelyn Leembruggen

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EDUCATION

Harvard University, Cambridge, MA

May 2024

PhD in Theoretical Physics

Dissertation Title: Buckling, wrinkling, and crumpling of simulated thin sheets

Ford Pre-Doctoral Fellow | NSF Graduate Research Fellow | Ashford Fellow

University of Cincinnati, Cincinnati, OH

April 2018

Triple major in Physics, Astrophysics, Mathematics

Goldwater Scholar | Phi Beta Kappa | Louis Stokes Alliance for Minority Participation Scholar

SKILLS

Communicating: Public speaking, science writing (lay/technical), curriculum creation, grant writing

Media: Premiere Pro, Photoshop, Lightroom, website maintenance, camera/sound/lighting

Computation: Python, C++, Mathematica, LaTeX, Word, Excel, PowerPoint

SCIENCE COMMUNICATION

SciShow Script Writer

May 2024-present

Complexly, Missoula, MT

- Writing and fact-checking video scripts on topics in physics, astronomy, and materials science.

Jackson Wild Media Lab Fellow

2023

Jackson Wild, Jackson, WY

- Produced a 5-minute documentary from brief to premiere in 5 days, coordinating clients, interviewees, a small production team, and a composer.

Curriculum Developer

June 2022-present

Galactic Polymath, Minneapolis, MN

- Planning lessons and creating assets for grades 5-12 based on current scientific research projects.
- Collaborating with liaisons from Indigenous communities to build culture-forward science lessons.
- Aligning educational material to national educational standards such as NGSS and Common Core.

Freelance Science Speaker

2021-present

- TEDx speaker and guest scientist expert on podcasts and YouTube videos.

President, Co-Founder

2020-present

A World of Women in STEM, Cambridge, MA

- Conceptualized, designed, and launched an online learning platform dedicated to 7th-10th graders which garnered 35,000+ website hits and 500,000+ video views within our first two years.
- Leading a team of 30+ contributors split into multiple working groups as we develop multiple pieces of media per month. Supervising the teams from idea conception to final production.
- Filming videos and editing in Premiere Pro and Audition, with additional photography and editing skills in Photoshop and Lightroom.

RESEARCH AND TEACHING EXPERIENCE

Physics Department Teaching Fellow

2021-2023

Harvard University, Cambridge, MA

- Received the White Prize for Excellence in Teaching in 2021 and 2024.
- Taught two intro level undergraduate courses (50+ students) surveying theoretical physics, and one advanced graduate level course (10 students) about specialized topics in condensed matter physics.

Graduate Researcher, Computational Soft Condensed Matter

2019-2024

Harvard University, Cambridge, MA | Advisor: Chris H. Rycroft (University of Wisconsin-Madison)

- Lead and managed doctoral thesis research comprised of 3 projects with experimental collaborators.
- Built custom C++ libraries; processed and visualized large amounts of data in Python.
- Developed research talks from 2 to 90 minutes long for audiences from general to technical.

Undergraduate Researcher, Theoretical Cosmology **2016-2018**
University of Cincinnati, Cincinnati, OH | Advisor: L.C.R. Wijewardhana

- Co-authored 7 papers probing the viability of a theoretical dark matter candidate called the axion, considering a range of proposed properties, and its potentially detectable signatures.

UNIVERSITY SERVICE

Equity & Inclusion Committee, Grad Rep **2019-2022**
Harvard University, American Physical Society Inclusion, Diversity, and Equity Alliance (APS IDEA)

- Chair of subgroup to create and conduct a community engagement assessment and report.
- Key member of the Harvard Physics Statement of Values and Code of Conduct subgroups.

Women in Physics, Co-Chair **2019-2021**
Harvard University, Cambridge, MA

- Led efforts to found, organize, and present a workshop on Building Inclusive Community for first year physics graduate students which serves 20-40 graduate students each year.
- Planned and hosted professional development, dinners, and socials for up to 60 attendees.

SELECTED HONORS AND AWARDS

Teaching and Leadership

The White Prize for Excellence in Teaching, Harvard University Physics Department	2021 & 2024
The Robbins Prize for Graduate Leadership, Harvard University Physics Department	2020
Presidential Leadership Medal of Excellence, University of Cincinnati	2018
Eleanor Hicks Outstanding Female Senior Award, University of Cincinnati College of Arts & Sciences	2018
Outstanding Tutor of the Year Award, College Reading & Learning Association	2017

Research

Leroy Apker Award finalist, American Physical Society	2018
Barry M. Goldwater Scholar	2017

Fellowships and Scholarships

Ford Foundation Pre-Doctoral Fellow, National Academy of Sciences, Engineering, and Medicine	2018
Graduate Research Fellow, National Science Foundation	2018
Ashford Fellow, Harvard University	2018
Graduate Prize Fellow, Harvard University Graduate School of Arts & Sciences	2018
Violet M. Diller Scholarship, University of Cincinnati Department of Physics	2016-2018
Cincinnati Academic Scholarship, University of Cincinnati	2014-2018
Louis Stokes Alliance for Minority Participation Scholar, National Science Foundation	2014-2018

Academic Honors

Helen Weinberger Award, University of Cincinnati Phi Beta Kappa Society	2018
Graduating Senior Award, University of Cincinnati Department of Physics	2018
Chapter Junior Award, University of Cincinnati Phi Beta Kappa Society	2017
Junior Award, University of Cincinnati Department of Physics	2017

SELECTED PUBLICATIONS

M. Leembruggen, J. Andrejevic, A. Kudrolli, C.H. Rycroft (2024). “Bendability parameter for twisted ribbons to describe longitudinal wrinkling and delineate the near-threshold regime.” *Physical Review E Letters* 109, L053001

M. Leembruggen, J. Andrejevic, A. Kudrolli, C.H. Rycroft (2023). “A computational model of thin elastic ribbons”. *Physical Review E* 108, 015003

J. Eby, **M. Leembruggen**, L. Street, P. Suranyi, L.C.R. Wijewardhana (2020). “Galactic condensates composed of multiple axion species”. *Journal of Cosmology and Astroparticle Physics*. 2020(10)020

J. Eby, **M. Leembruggen**, P. Suranyi, L.C.R. Wijewardhana (2018). “Stability of Condensed Fuzzy Dark Matter Halos”. *Journal of Cosmology and Astroparticle Physics*. 2018(10)058

J. Eby, **M. Leembruggen**, J. Leeney, P. Suranyi, L.C.R. Wijewardhana. (2017). “Collisions of Dark Matter Axion Stars with Astrophysical Sources”. *Journal of High Energy Physics*. 2017(4)99

J. Eby, **M. Leembruggen**, P. Suranyi, L.C.R. Wijewardhana. (2016). “Collapse of Axion Stars”. *Journal of High Energy Physics*. 2016(12)66