

Madelyn Leembruggen

EDUCATION

Harvard University, Cambridge, MA

Expected May 2024

PhD Candidate in Theoretical Physics

Thesis Title: Buckling, wrinkling, and crumpling via a mechanical model for 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

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

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

Communicating: Grant writing, public speaking, curriculum creation, workshop facilitating

SCIENCE COMMUNICATION EXPERIENCE

Jackson Wild Media Lab Fellow

2023

Jackson Hole, WY

- Collaborated with a team of 4 to produce a short documentary

Freelance Science Speaker

2021-present

- *Soup, Salad, or Sandwich? Physics has the answer*, Speaker at TEDxDayton, Dayton, OH
- *Making Sense-ity of Density*, Guest Expert on STEAM Daydream podcast, Washington, D.C.

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 10,000+ website hits and 100,000+ video views within our first year.
- 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.

Content Developer

2022-2023

Galactic Polymath, Minneapolis, MN

- Planning lessons and creating assets for grades 5-12 based on current scientific research projects.
- Aligning educational material to national educational standards such as NGSS and Common Core.

RESEARCH AND TEACHING EXPERIENCE

Physics Department Teaching Fellow

2021-2023

Harvard University, Cambridge, MA

- Received the 2021 White Prize for Excellence in Teaching
- 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-present

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

- Leading and managing doctoral thesis research project to discretely model continuous thin materials and quantify the statistics of paper crumpling.
- Building custom C++ libraries; processing and visualizing large amounts of data in Python.
- Developing 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 about a theoretical dark matter candidate called the axion.

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 events, dinners, and social events for up to 60 attendees.

SELECTED HONORS AND AWARDS

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

Cincinnatus Academic Scholarship, University of Cincinnati 2014-2018

Teaching and Leadership

The White Prize for Excellence in Teaching, Harvard University Physics Department 2021

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

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

PUBLICATIONS

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, L. Street, P. Suranyi, L.C.R. Wijewardhana (2019). "A Global View of QCD Axion Stars". *Physical Review D* 100, 063002

J. Eby, M. Leembruggen, L. Street, P. Suranyi, L.C.R. Wijewardhana (2019). "Approximation methods in the study of boson stars". *Physical Review D* 98, 123013

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, P. Suranyi, L.C.R. Wijewardhana (2017). "QCD Axion Star Collapse with the Chiral Potential". *Journal of High Energy Physics*. 2017(6)14

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