

Madison Morey

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EDUCATION:

Boston University, Boston, MA

Sept. 2020 – Present

Division of Material Science and Engineering – Ph.D. Candidate

Merrimack College, North Andover, MA

Sept. 2015 – May 2019

Bachelor of Science in Mechanical Engineering, Summa Cum Laude

Minor: Chemistry, Math

Outstanding Senior Award

May 2019

- For outstanding achievement and the highest grade point average in the Mechanical Engineering program

Professional Experience:

National Science Foundation Graduate Research Fellow, Boston University

Sept 2022 – Present

Graduate Research Assistant, Boston University, Computational Energy Laboratory

Jan. 2021 – Present

- Numerical Simulations of multiphase systems, focus on energy storage.
- Computational modeling of dendrite growth and nucleation in lithium metal batteries.
- Verification of model's accuracy against analytical solutions and validated the model against experimental data.

National Science Foundation Internship Program, Oak Ridge National Lab

Jun. 2022 – Dec. 2022

- Energy Storage and Conversion Manufacturing Group
- Experimental work regarding the cycling of anode-less batteries.
- Experimentally studied lithium plating on various surfaces.

Graduate Teaching Fellow, Boston University

Sept. 2020 – Dec. 2020

Integral Biosystems, Inc

Jun. 2019 – Jul. 2020

- Worked as a research associate in the research and development department, focusing on novel drug delivery systems.
- Specialized in characterization of biomaterials.

Undergraduate Research Assistant, Merrimack College

Jul. 2017 – May 2019

- Biomaterials Research: synthesis of a nylon- like photostrictive polymer to be used for synthetic muscle research
- Vibration Damping and Loss Research: ran simulations and worked towards developing an equation to define vibration waves at different positions along a beam via piezoelectric sensors.

Hockey East Regular Season Champion Trophy

Mar. 2018 – Mar. 2019

- Worked with a graphic design student at Merrimack College to design and 3D model the Women's Hockey East Association regular season champion trophy using CAD Software.

PUBLICATIONS:

1. **Madison Morey**, John Loftus, Andrew Cannon, Emily Ryan. (2022). "Interfacial Studies on the Effects of Patterned Anodes for Guided Lithium Deposition in Lithium Metal Batteries", *Journal of Chemical Physics*, <https://doi.org/10.1063/5.0073358>.
2. Trevor Melsheimer, **Madison Morey**, Andrew Cannon, Emily Ryan (2022). "Modeling the effects of pulse plating on dendrite growth in lithium metal batteries", *Electrochimica Acta*, <https://doi.org/10.1016/j.electacta.2022.141227>
3. Xinyuan Shan, **Madison Morey**, Zhenxi Li, Sheng Zhao, Shenghan Song, Zhenxue Xiao, Hao Feng, Shilun Gao, Guoran Li, Alexie P. Sokolov, Emily Ryan, Kang Xu, Ming Tian, Yi He, Huabin Yang and Peng-Fei Cao. (2022). "A Polymer Electrolyte with High Cationic Transport Number for Safe and Stable Solid Li-Metal Batteries", *ACS Energy Letters*, <https://pubs.acs.org/doi/10.1021/acsenenergylett.2c02349>

CONFERENCE PROCEEDINGS:

1. "Understanding the Effect of Surface Energy on Dendrite Growth in Lithium Metal Batteries", *Material Research Society's Fall Meeting and Exhibit*. Boston, Massachusetts, Nov. 27 – Dec. 2, 2022.

2. “Impact of Surface Characteristics on Interfacial Stability in Lithium Metal Batteries”, 243rd ECS Meeting, Boston, Massachusetts, May 28 - June 2, 2023.

OTHER EXPERIENCE:

Mathematics Peer Tutor, Merrimack College Math and Tutoring Center

Sept. 2016 – May 2019

- Tutored STEM classes on a drop-in basis.

Chemistry Tutor, Konjoian Education Center

Jan. 2018 – May 2019

ACTIVITIES AND INVOLVEMENT:

Student Association of Graduate Engineers, Boston University.

Sept. 2021 – Present

- President
- Vice President
- Treasurer
- Material Science and Engineering Division Representative

May 2023 – Present

Jan. 2023 – May 2023

May 2022 – Dec. 2022

Sept. 2021 – May 2022

Material Science and Engineering Mentorship Program, Boston University

Sept. 2021 – Present

- Mentor

Graduate Women in Science and Engineering, Boston University

Sept. 2021 – Sept. 2022

- Material Science and Engineering Division Representative

Merrimack College Women’s Hockey (NCAA D1, Hockey East)

Aug. 2015 – Mar. 2019

- Recipient of the Athletic Director’s Award

May 2019

Title IX Student- Athlete Representative for Merrimack College

Sept. 2016 – May 2019

Merrimack College Engineering Honors Society

Mar. 2018- Present

- Tau Beta Pi Chapter

Sigma XI, The Scientific Research Honor Society

Apr. 2019 - Present

Society of Women Engineers (SWE), Merrimack Student Chapter

Jan. 2017 – May 2020

- Fundraising Chair

Sept. 2017 – May 2018