

MATTHEW J FRAZIER

mjfrazier@uchicago.edu | 262-203-3009 | Chicago, IL | mjfrazier.us

EDUCATION

- M.S. University of Chicago** | Chicago, IL | Computational and Applied Mathematics May 2025 (exp.)
B.S. University of Wisconsin | Madison, WI | Physics and Mathematics May 2018

RESEARCH EXPERIENCE

Committee on Computational and Applied Math, University of Chicago | Chicago, IL April 2024-

Advisor: Dr. Guillaume Bal

- Master's Thesis: "Topological Properties of Cold Magnetized Plasma."
- Developing a full characterization of the spectral and topological properties of cold magnetized plasmas and investigating new numerical methods for analyzing the spectrum of differential operators at interfaces.

Department of Physics, University of Wisconsin | Madison, WI December 2015- May 2018

Principal Investigator: Dr. Pupa Gilbert

- Undergraduate Thesis: "New Method for Crystal Orientation Analysis of Mineral Samples and Application to Microstructure and Formation of Ooids."
- Coral Biomineralization and Spherulitic Growth: Investigation of the growth mechanisms of coral skeletons, primarily through X-ray spectroscopy and Polarization-dependent Imaging Contrast (PIC)-mapping to characterize Carbonate crystal grains on the micro- and nano-scale.

Department of Mathematics, University of Wisconsin | Madison, WI Summer 2017

- UW-Madison Undergraduate PDE Summer School: Four short courses on topics in PDE's for undergraduates. Completed reading project on energy dissipation in Navier-Stokes fluids.

PROFESSIONAL EXPERIENCE

USS Georgia, United States Navy | King's Bay, GA August 2020- August 2023

Tactical Systems Officer/Officer of the Deck

- Supervisor of the operation and maintenance of the ship's acoustic and tactical weapons systems.
- Ship driver and planner of submarine missions.

Electrical Assistant/Engineering Duty Officer

- Operational supervisor of reactor plant during normal operations and extensive repair periods.
- Supervisor of maintenance and operation of ship's electrical generation and distribution equipment.

Nuclear Power Training Unit, United States Navy | Charleston, SC June 2018-August 2020

Nuclear Engineering Officer Trainee

- Top performer in classroom and practical courses leading to qualification to operate Naval reactors.

University of Wisconsin-Madison Housing Department | Madison, WI September 2015- May 2017

Math Tutor

- Residential math tutor for calculus and differential equations courses.

PUBLICATIONS AND PRESENTATIONS

Mass T, Giuffre AJ, Sun C-Y, Stifler CA, Frazier MJ, Neder M, Tamura N, Stan CV, Marcus MA, Gilbert PUPA.

Amorphous Calcium Carbonate Particles Form Coral Skeletons.

Procs Natl Acad Sci 114, E7670-E7678 (2017).

DOI: [10.1073/pnas.1707890114](https://doi.org/10.1073/pnas.1707890114), Highlighted in Science 357, 1012 (2017).

Sun C-Y, Marcus MA, Frazier MJ, Giuffre AJ, Mass T, Gilbert PUPA.

Spherulitic Growth of Coral Skeletons and Synthetic Aragonite: Nature's Three-Dimensional printing.

ACS Nano 11, 6612–6622 (2017).

DOI: [10.1021/acsnano.7b00127](https://doi.org/10.1021/acsnano.7b00127).

Frazier MJ, Sun C-Y, Keikhosravi A, Eliceiri KW, Bergmann KD, Gilbert PUPA. Microstructure and Formation of Ooids. Poster session presented at: University of Wisconsin-Madison Undergraduate Symposium; 2018, 13 April; Madison, WI.

FELLOWSHIPS

Hilldale Undergraduate Research Fellow | Madison, WI

September 2017- May 2018