

Benjamin A. Hyatt

NSF Graduate Research Fellow

PhD Candidate in Engineering Sciences and Applied Mathematics, Northwestern University

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Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)

1800 Sherman Avenue, Evanston, IL 60201

Department of Engineering Sciences and Applied Mathematics (ESAM), Northwestern University

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EDUCATION

PhD in Engineering Sciences and Applied Mathematics Northwestern University	Expected 2026
MS in Engineering Sciences and Applied Mathematics Northwestern University	2022
BS in Mathematics with Minors in Physics and Philosophy University of Maryland, Baltimore County (UMBC) Summa Cum Laude, with Departmental Honors GPA: 4.0	2021

WORK EXPERIENCE

Lawrence Livermore National Laboratory , Livermore, CA Computing Graduate Student Intern	2024
Johns Hopkins University, Applied Physics Laboratory , Laurel, MD Technical Staff (2018-2019) NASA Intern (2017, 2018) ASPIRE Intern (2016-2017)	2016 - 2019

RESEARCH INTERESTS

Numerical Methods: numerical stability, IMEX and multi-rate timestepping schemes, pseudospectral methods, high-performance computing

Planetary Science and Astrophysics: atmospheric dynamics, aerosols, global climate models, stellar interiors, and space exploration

HONORS AND FELLOWSHIPS

NSF Graduate Research Fellowship	2023 - 2025
Outstanding Teaching Assistant Award, ESAM Department	2022 - 2023
Walter P. Murphy Fellowship, Northwestern University	2021 - 2022
Outstanding Graduating Senior in Mathematics, UMBC	2021
Freeman A. Hrabowski President's Advisory Council Scholarship, UMBC	2020
Undergraduate Research Award, UMBC	2019 - 2020
Undergraduate Merit Scholarship, UMBC	2017 - 2021

PUBLICATIONS

5. Ballouz R. L. Ernst C. M., Barnouin O. S., Daly R. T., DellaGiustina D. N., **Hyatt B. A.**, Martin A. C., “Seismic resurfacing of asteroid (433) Eros indicates a highly dissipative interior for large near-Earth asteroids” (Nat. Astron, 2024).
4. Anders E. H., Lecoanet D., Cantiello M., Burns K. J., **Hyatt B. A.**, Kaufman E., Townsend R. H. D., Brown B. P., Vasil G. M., Oishi J. S., Jermyn. A. S. “The photometric variability of massive stars due to gravity waves excited by core convection” (Nat. Astron, 2023).
3. Ernst C. M., Daly R. T., Gaskell R. W., Barnouin O. S., Nair H., **Hyatt B. A.**, Al Asad M. M., Wilcomb K. K. “High-resolution Shape Models of Phobos and Deimos from Stereophotoclinometry” (Earth Planets Space, 2023).
2. **Hyatt B.**, Shen. J., “Stability Analysis of Model Predictive Control-Based Car-Following Control Under Linear Vehicle Dynamics” (UMBC Review, 2020).
1. Sheth S., Barnard E., **Hyatt B.**, Rathinam M., Zustiak S. P., “Predicting Drug Release from Degradable Hydrogels Using Fluorescence Correlation Spectroscopy and Mathematical Modeling” (Front. Bioeng. Biotechnol., 2019).

PRESENTATIONS

Contributed Poster, AGU24 “Error Analysis of Single and Multi-rate Temporal Coupling Approaches in a Simplified Aerosol System”	2024
Invited Talk, PAESCAL SciDAC group meeting “Process coupling strategies in a simplified aerosol model”	2024
Contributed Poster, LLNL Summer SLAM “Error Analysis of Single and Multi-rate Temporal Coupling Approaches in a Simplified Aerosol Model”	2024
Contributed Talk, 76th APS Division of Fluid Dynamics Annual Meeting “Timestepping stability in pseudospectral methods”	2023
Contributed Talk, 75th APS Division of Fluid Dynamics Annual Meeting “Relaxing timestep restrictions for numerical stability in DNS”	2022
Contributed Talk, UMBC SURF “Stability Analysis Of Car-Following Control Of Linear Vehicle Dynamics With General MPC Horizon”	2020
Contributed Poster, UMBC URCAD “A Reaction-Diffusion PDE Model for Predicting Solute Release”	2020
Contributed Talk, APL NASA Intern Presentation, “Examining the Geologies and Shapes of Small Bodies”	2018
Contributed Talk, APL NASA Intern Presentation, “Examining the Geologies and Shapes of Small Bodies”	2017

TEACHING EXPERIENCE

Graduate Teaching Assistantship Northwestern University GEN_ENG 206-4 Honors Engineering Analysis 4 (Spring 2023) ES_APPM 252-1,2 Honors Multivariable Calculus (Fall 2022, Winter 2023)	2022 – 2023
Teaching Assistant UMBC	2019 – 2021

MATH 225 Differential Equations (Fall 2020, Spring 2021)
PHYS 224 Vibrations and Waves (Spring 2020)
PHYS 324 Modern Physics (Fall 2019)

SERVICE AND MENTORSHIP

Causeway Program Mentor 2023 – 2024

Mentored a post-baccalaureate student at Northwestern University who went on to begin doctoral studies at Purdue University in applied mathematics

REACH Program Mentor 2023

Co-mentored a local Evanston high school student at CIERA for three weeks during the summer on a project related to asteroseismology, sonification of astrophysical data, and programming in Python

Member of Climate Action Team 2022 – 2024

Worked with CIERA members to collaborate with a third-party organization Visceral Change to conduct a workplace DEI climate survey, analyze results, and incorporate community feedback in order to develop a set of recommended actions to improve DEI climate

First-year Foundations Workshop Northwestern University Fall 2022

Introduced incoming first-year PhD students to the Department of Engineering Sciences and Applied Mathematics, and ran review sessions to prepare them for their preliminary exams