

Emily McPike

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EDUCATION

City University of New York Graduate Center | New York, NY

Aug 2024 – May 2026

M.S. in Astrophysics

Ritsumeikan University | Kyoto, Japan

May 2024 – Jul 2024

Study Abroad Program in Japanese Culture and Literature

James Madison University | Harrisonburg, VA

Aug 2020 – Jul 2024

Honors Scholar with Distinction in Physics

B.S. in Physics

Minors: Astronomy, Mathematics, Computational Analytics, Honors Interdisciplinary Studies

RESEARCH EXPERIENCE

James Madison University, Department of Physics & Astronomy

Undergraduate Research Assistant; Advisor: Dr. Anca Constantin

May 2021 – May 2024

- Honors Thesis: “Mid-infrared Variability in Galaxies Surveyed for H₂O Megamaser Emission”
 - Conducted quantitative analysis of WISE telescope observations using Python, including data cleaning, outlier rejection, and statistical analysis.
 - Developed computational models in Python to simulate light curves and other intrinsic properties of galaxies surveyed, contributing to the understanding of their central black hole’s behavior.
 - Identified and addressed challenges in data analysis and modeling, demonstrating adaptability and analytical thinking.
 - Presented research findings at departmental meetings and conferences, effectively communicating complex scientific concepts to diverse audiences.

Advanced Physics Laboratory I & II; Advisor: Dr. Klebert Feitosa

Aug 2022 – Dec 2022

- Designed experiments to test adhesiveness of dense aqueous foams over time with rheometry.
- Built Python code to quantify and visualize how adhesiveness is compounded by both time and the deformation from manual compression of the bubbles within the foam sample.

James Madison University, Department of Mathematics & Statistics

Independent Study; Advisors: Dr. Stephen Lucas, Dr. David Duncan

Jan 2024 – May 2024

- Created code in MATLAB and Python to simulate geodesics for n-gons of equal area to optimize energy between transformations.

WORK EXPERIENCE

James Madison University, Teacher’s Assistant

Classical Mechanics

Aug 2023 – Dec 2023

- Assisted in an advanced mechanics course by grading homework and conducting homework help sessions in office hours.

Foundations of Physics

Aug 2023 – Dec 2023

- Provided in-class assistance and held office hours for an Introduction to Python in Physics Course, focusing on teaching fundamental Python skills to physics students.

Introductory Physics I & II

Aug 2022 – May 2023

- Graded assignments for both introductory calculus-based physics courses, covering topics such as kinematics, forces, electromagnetism, and optics.

James Madison University, Physics Stockroom Aid

Aug 2022 – May 2023

- Managed materials and apparatuses for introductory physics lab courses, including assembly, disassembly, and cataloging items in storage.

HONORS/AWARDS

JMU Physics & Astronomy Department Undergraduate Service Award

Apr 2024

This award is selected by the JMU Physics and Astronomy faculty, and given to a Physics and Astronomy major who has shown substantial contributions in service to the department.

Sigma Pi Sigma Physics Honor Society

Apr 2024

Elected to membership by a committee of JMU Physics and Astronomy faculty for high achievement in general scholarship and outstanding service in physics.

Society of Physics Students Outstanding Service Award

Apr 2024

This award recognizes deserving students who exemplify an attitude of service to the discipline of physics and astronomy through positive impact on an SPS chapter, a department, or the broader community.

Dingledine-Bluestone Scholarship

May 2020

The Dingledine-Bluestone Scholarship is equivalent to in-state tuition and fees per year for a total of four years. Scholars are selected by exemplifying excellence in academic achievement, leadership, and community service.

CONFERENCES & PRESENTATIONS

Mid-infrared Variability of Galaxies Surveyed for H₂O Megamaser Emission

2024 JMU Physics and Astronomy Symposium (*Talk*) - Awarded 3rd Place for Best Talk

2024 JMU Honors College Symposium (*Poster*)

2024 SPS Zone 4 Meeting at Virginia Tech (*Poster*)

2024 APS Conference for Undergraduate Women in Physics at West Virginia University (*Poster*)

2023 JMU Chemistry and Biochemistry Summer REU Symposium (*Talk*)

2023 JMU Physics and Astronomy Symposium (*Talk*)

2023 JMU Honors College Symposium (*Poster*)

2023 National Conference on Undergraduate Research at University of Wisconsin Eau-Claire (*Poster*)

2022 JMU Chemistry and Biochemistry Summer REU Symposium (*Talk*)

2022 JMU Physics and Astronomy Symposium (*Talk*)

2022 JMU Honors College Symposium (*Poster*)

2022 Virginias Collegiate Honors Council Conference at Lynchburg University (*Talk*)

2021 JMU Chemistry and Biochemistry Summer REU Symposium (*Poster*)

EXTRACURRICULARS/OUTREACH

JMU Society of Physics Students

Mar 2023 – May 2024

President

- Organize events to encourage scientific exploration, scholastic opportunity, faculty-student dialog, and reconnect the student environment post-quarantine.
- Organized material, coordinated volunteers, and held science presentations and demonstrations with local libraries by fostering outreach between JMU Physics and Massanutten Regional Libraries.
- Secured >\$20,000 of funding for events, educational field trips, and professional conference travel.
- Other roles held: Vice President (Mar 2022 – Mar 2023), Secretary (Mar 2021 – Mar 2022), Social Media Coordinator (Mar 2021 – Mar 2022)

JMU Women in Physics

Aug 2022 – May 2024

President

- Implemented Gray Area in Physics, a seminar aimed to anonymously discuss and address systemic issues faced by minority students in the physics department.
- Implemented sharing Office of Disability Services resources with incoming physics majors in lectures.
- Ensured feminine hygiene products were permanently stocked in the women's restroom.

JMU College of Science and Mathematics Student Council

Aug 2022 – May 2024

Physics Representative, Math Representative

- Advocate for and advise solutions on pertinent student concerns to CSM administration like fees and professional resources; proposed and coordinated the first CSM career conference held October 2023.
- Plan events that encourage cross-department collaboration and integration of CSM-focused majors like CSM olympics, trivia nights, graduating student celebrations, and career advising nights.

JMU President's Council

Aug 2022 – May 2024

Society of Physics Students Representative, Women in Physics Representative

- Represent SPS and WiP on the university scale at the JMU President's Council.

JMU MadiSTEM

Mar 2022, Mar 2023, Mar 2024

Volunteer

- Lead hands-on STEM workshops organized by JMU faculty and students with a focus on inspiring STEM interest of middle school girls. Invited to speak, sharing stories about studying physics in college.

JMU Physics Ambassador

Mar 2021 – May 2024

Volunteer

- Invited to speak on student panels to discuss experience in research and scholarship in the JMU Physics Department and lead science demonstrations at JMU open house events.

SKILLS

Proficient

Python, SQL, LaTeX, Mathematica, MATLAB