

MADISON VANWYNGARDEN

madv@bu.edu | 402-213-9878 | Boston, MA | [GitHub](#)

Education

Boston University | Boston, MA

May 2024

- Graduated Magna Cum Laude with a BA in Astronomy & Physics, GPA: 3.85/4.0

Research Experience

Canadian Institute for Theoretical Astrophysics | University of Toronto

September - April 2023

Fulbright Student

- Investigated the origin of biases and the effect of catalog incompleteness on the measurement of the Hubble constant from the gravitational wave + galaxy catalog method.

Center for Astrophysics | Harvard & Smithsonian | Cambridge, MA

July - August 2023

Student Researcher

- Concluded work on my Harvard-Smithsonian REU project which I began in Summer 2022 and composed a first-author manuscript published in The Astronomical Journal.

European Center for Nuclear Research (CERN) | Geneva, Switzerland

February - July 2023

Research Intern

- Applied machine-learning techniques in Python and ROOT to argue for the introduction of timing-capable detectors within the inner tracker of the ATLAS experiment. Presented research to senior scientists in ATLAS Data Processing Group.

Harvard-Smithsonian Astrophysical Observatory Summer REU Program | Cambridge, MA

June - August 2022

Research Intern

- Developed highly-adaptable Python software to compare theoretical exoplanet formation and evolution mechanisms against existing orbital and planetary observations during a summer research program at the Harvard-Smithsonian Center for Astrophysics. All software is publicly available on [GitHub](#).

BU White Dwarf Research Group | Boston, MA

February 2021 - May 2022

Research Assistant

- Identified and catalogued new pulsating white dwarf stars through photometric analysis in Python, increasing the known sample by 20%. Derived stellar rotation periods and contributed a periodogram figure as a co-author to a 2022 publication in *MNRAS*.

Teaching Experience

PY212: General Physics II | Boston University

September 2023 - May 2024

Undergraduate Learning Assistant

- Led three weekly discussion sections and held two office hours to assist 75+ students in an introductory course on electricity and magnetism. Completed a course on pedagogical practices in STEM disciplines to learn and implement novel teaching strategies.

Leadership & Outreach

Boston University Astronomical Society | Co-President

August 2021 - present

- Restarted the society, recruited 30+ new members, coordinated ~10 university-wide outreach events, secured funding from the Astronomy department, and assisted in planning and leading bi-weekly meetings.

Society of Women in Space Exploration | President

August 2021 - present

- Planned bi-weekly meetings with the executive board and coordinated events with other on-campus organizations focused on the representation of women in STEM. Responsible for email communications with members.

Peers for Incoming Student Mentorship (PRISM) | Mentor

August 2022 - present

- Mentored freshman through course registration, starting research, and combating imposter syndrome during their first year in the physics department.

Presentations

“Modeling Multiple Radius Valley Emergence Mechanisms with Multi-Transiting Systems”

- Harvard-Smithsonian CfA Astronomy REU Symposium – [Oral talk](#) August 2022
- 241st Meeting of the American Astronomical Society – [iPoster](#) January 2023
- Barry Goldwater Research Symposium – Poster August 2023
- Conference for Undergraduate Women in Physics – Poster January 2024

“Development of a Practice Problem Bank for PY212”

- Boston University Experiential Learning Expo – Poster December 2023

“Identification of 63 New Pulsating White Dwarf Stars with TESS”

- Boston University 24th Annual Undergraduate Research Symposium – Poster October 2021

Publications

“Modeling Multiple Radius Valley Emergence Mechanisms with Multi-Transiting Systems,” VanWyngarden, M., Cloutier, R. (2023) *The Astronomical Journal*, [10.3847/1538-3881/ad6903](https://doi.org/10.3847/1538-3881/ad6903).

“Discovery of 74 new bright ZZ-Ceti stars with the first three years of TESS,” Romero, A. D., Kepler, S. O., Hermes, J.J., Amaral, L. A., Uzundag, M., Bognár, Z., Bell, K. J., VanWyngarden, M., Baran, A., Pelisoli, I., Oliverira da Rosa, G., Koester, D., Klippel, T. S., Fraga, L., Bradley, P. A., Vučković, M., Heintz, T. M., Reding, J. S., Kaiser, B. C., & Charpinet, S. (2022). *Monthly Notices of the Royal Astronomical Society*, [2022MNRAS.511.1574R](https://doi.org/10.1093/mnras/stz311).

Honors & Awards

BU Institute for Astrophysical Research Undergraduate Research Prize 2024

BU Physics Faculty Award for Joint & Interdisciplinary Majors 2024

73rd Lindau Nobel Laureate Meeting 2024

One of 200 international undergraduate physicists selected to participate in Lindau, Germany

Fulbright Student Award 2024

Universities’ Space Research Association Distinguished Undergraduate 2023

One of 5 students chosen from 98 nationwide nominations for academic achievement, leadership, and engagement

Goldwater Scholar 2023

Augustus Howe Buck Scholar 2023 – 2024

Full tuition scholarship and the highest honor awarded to students in the College of Arts & Sciences

Boston University Presidential Scholarship 2020 – 2024

\$25,000 annual merit-based scholarship

Boston University Dean’s List 2020 – 2024

BU Undergraduate Research Opportunities Program Faculty Matching Grant 2020

National Merit Scholar 2020

Skills

- Programming:* proficient in Python, Mathematica, C++, and ROOT
- Computer Software:* proficient in Adobe Suite, SAOImageDS9, LaTeX, and GitHub