

Brendan Boyd

boyd.brendan@stonybrook.edu

biboyd.github.io

Education

SUNY Stony Brook University Physics & Astronomy Department <i>PhD Candidate in Physics,</i> <i>with Concentration in Astronomy</i>	2020-Present
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Michigan State University College of Natural Science Honors College <i>Bachelor of Science, Astrophysics</i> <i>Minors in Math and CMSE</i>	2016-2020
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Research Experience

Type Ia Supernovae Progenitor Modeling Using the MAESTROeX hydrodynamic code to study the convective Urca process during simmering phase of white dwarfs.	2022-Present
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Galactic Modeling Research Studied ENZO simulations produced by FOGGIE collaboration to better understand the Circumgalactic Medium (CGM). Generated synthetic spectra of the CGM to better inform/compare to observations.	2019-2020
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MSU Campus Observatory Assisted in data collection and reduction using 24-inch telescope. Observed cataclysmic variables, supernovae and transiting exoplanets.	2018-2019
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HAWC Research Group Studied gamma ray sources using the HAWC Observatory. Mainly worked on improving the detection sensitivity through machine learning techniques.	2016-2018
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Publications

Brendan Boyd et al. "Sensitivity of 3D Convective Urca Simulations to Changes in Urca Reactions". In: *arXiv e-prints*, arXiv:2311.07743 (Nov. 2023), arXiv:2311.07743. DOI: 10.48550/arXiv.2311.07743. arXiv: 2311.07743 [astro-ph.SR]

Alexander I. Smith et al. "pynucastro: A Python Library for Nuclear Astrophysics". In: *The Astrophysical Journal* 947.2, 65 (Apr. 2023), p. 65. DOI: 10.3847/1538-4357/acbaff

Brendan Boyd et al. "SALSA: A Python Package for Constructing Synthetic Quasar Absorption Line Catalogs from Astrophysical Hydrodynamic Simulations". In: *The Journal of Open Source Software* 5.52, 2581 (Aug. 2020), p. 2581. DOI: 10.21105/joss.02581

Teaching Experience

Teaching Assistant

2020-2021

AST 248: The Search for Life in the Universe. A course designed to give an overview of the current knowledge of life outside of Earth and how we are searching for it. Topics such as habitability in our solar system, biosignatures, Fermi Paradox, etc. Stony Brook, Fall 2020; Spring 2021; Fall 2021.

Undergraduate Learning Assistant

2019-2020

AST 208: Planets & Telescopes. A course dedicated to learning the different observational techniques and data processing used in astronomy as well as the study of exoplanets. Michigan State, Spring 2020.

AST 207: The Science of Astronomy. A course introducing the many concepts and techniques used in astronomy to astrophysics majors. Michigan State, Fall 2019.

ISP 205: Visions of the Universe. A survey astronomy course focusing on the modern conception of observation, stars and cosmology. Michigan State, Spring 2019.

Computational Skills

Programming Languages:

Proficient in Python

Proficient in C++

Competent in MPI parallelism

Competent in OpenMP threading

Competent in FORTRAN

Basic knowledge of HTML

Summer Schools Attended

International High Performance Computing Summer School

2022

Summer school for early-career computational scientists. Familiarized students with major state-of-the-art aspects of HPC and Big Data Analytics. Provided advanced mentoring and facilitated international networking.

Conferences Attended

Nuclei in the Cosmos 2023

2023

Presented Poster on simulations of the Convective Urca Process at NIC - Nuclear Astrophysics conference.

ASTRONUM 2023

2023

Presented a Poster on simulations of the Convective Urca Process at ASTRONUM - International Conference on Numerical Modeling of Space Plasma Flows.

American Astronomical Society Meeting 241

2023

Presented Poster on simulation of the Convective Urca Process at the winter AAS Meeting

Work Experience

IT Helpdesk Staff

2018-2019

Member of the Physics and Astronomy IT staff. Focused on providing immediate assistance with new installations and software issues on various OS's for researchers and faculty

Community Service and Outreach

MSU Observatory Public Nights

2018

Open house events at the MSU Observatory. Taught the public about astronomy and the work done at the observatory. Assisted people with looking through telescopes.

MSU Science Festival

2017-2018

Annual event used to inform and inspire the general public. Worked a station explaining the HAWC experiment and Cosmic Rays.

Tour de Ville

2016-2020

Annual charity bicycle ride put on by the Northville Rotary Club. Help with sending mass emails for the event as well as contributing the day of the ride (e.g. setting up of rest stops along course)

Honors and Awards

Hantel Fellowship

2017, 2019

Awarded to Michigan State undergraduates conducting research in physics.

Michigan State Dean's List

2016-2020

Recognized for eight semesters as a student with at least a 3.5 GPA.

References

Available Upon Request