Brendan Boyd

boyd.brendan@stonybrook.edu
biboyd.github.io

Education

SUNY Stony Brook University 2020-Present
Physics & Astronomy Department
Graduate Student
PhD Track in Physics with Concentration in Astronomy

Michigan State University 2016-2020
College of Natural Science
Honors College
Bachelor of Science, Astrophysics
Minors in Math and CMSE

Research Experience

Type Ia Supernovae Progenitor Modeling 2022-Present
Using the MAESTROeX code to study the convective URCA process in simmering White Dwarf's prior to thermonuclear runaway.

Galactic Modeling Research 2019-2020
Studying galactic simulations produced by ENZO to better understand the Circumgalactic Medium (CGM). Create synthetic spectra of the CGM to better inform observations.

MSU Campus Observatory 2018-2019
Assisted in data collection and reduction using 24-inch telescope. Observed cataclysmic variables, supernovae and transiting exoplanets.

HAWC Research Group 2016-2018
Studied gamma ray sources using the HAWC Observatory. Mainly worked on improving the detection capabilities through machine learning techniques.

Publications

Boyd et al., (2020). SALSA: A Python Package for Constructing Synthetic Quasar Absorption Line Catalogs from Astrophysical Hydrodynamic Simulations. Journal of Open Source Software, 5(52), 2581, https://doi.org/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. 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. MSU 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.

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

Computer Skills

Programming:
Proficient in Python
Proficient in C++
Proficient in FORTRAN
Moderate knowledge of Mathematica
Basic knowledge of HTML

OS's
Proficient in Linux (including terminal)
Proficient in Windows
Moderate knowledge of macOS

Machine Learning:
Experience in scikit-learn and Keras packages in Python
Experience in the methods/theories of many algorithms including SVM and PC

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 undergraduates conducting research.

MSU Dean's List 2016-2020
Recognized for eight semesters as a student with at least a 3.5 GPA.

References

Available Upon Request