

Mackenzie Warren, PhD

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Skills Summary

Programming skills Python (incl. numpy & scipy), C, Fortran, Bash/shell scripting, HDF5

Other skills Mentoring & teaching, grant & technical writing, public speaking, conference organizing

Recent Experience

North Carolina State University & Michigan State University

Raleigh, NC/East Lansing, MI

POSTDOCTORAL FELLOW

2018 - Present

- Awarded \$100,000/year through National Science Foundation Astronomy & Astrophysics Postdoctoral Fellowship to lead multi-institution collaboration to study supernovae.
- Co-Investigator on 1 million node-hours/year computing grant through the Department of Energy IN-CITE program.
- Developing ground-breaking algorithms to simulate cutting-edge physics in core-collapse supernovae for the first time. Deploying new physics features to the FLASH code (Fortran/C/Python), an export controlled code.
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Michigan State University

East Lansing, MI

POSTDOCTORAL RESEARCH ASSOCIATE

2016 - 2018

- Developed new algorithm to model turbulence in 1D astrophysical simulations built off of results from 3D simulations to save about a million core-hours per simulation. Implemented in the FLASH supernova code (Fortran/C/Python).
- Ran several thousand concurrent supernova simulations across thousands of nodes and generating TBs of data. Applied regression models using Python (including numpy and scipy packages) to simulated supernova data to create the first statistical understanding of supernova simulations and predict observable properties.
- Applying results to data pipeline improvements at LIGO/MIRGO and SNEWS observatories to increase the speed and accuracy of future scientific discoveries.

University of Notre Dame

Notre Dame, IN

GRADUATE RESEARCH ASSISTANT

2011 - 2016

- Vastly expanded & updated Fortran supernova code to include new physics features as a part of international collaborations.
- Awarded 2016 University of Notre Dame Shaheen Graduate School Award for accomplishments in research, teaching, coursework, & service.

Education

University of Notre Dame

Notre Dame, IN

PHD IN PHYSICS

2016

MS IN PHYSICS

2014

Reed College

Portland, OR

BS IN PHYSICS

2011