

MATTHEW

PORTMAN

CONTACT

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GitHub <https://github.com/MatthewPortman/>

EMPLOYMENT

Teaching Assistant 2019-Present
University of California, Irvine | Irvine, CA

Graduate Research Intern 2021, 2022
Lawrence Livermore National Lab | Livermore, CA

URA Visiting Scholar 2021-2022
Fermilab | Batavia, IL

Graduate Research Assistant 2017-2019
San Diego State University | San Diego, CA

Adjunct Faculty 2017
Collin County Community College | McKinney, TX

EDUCATION AND RESEARCH

University of California, Irvine 2019-Present
Ph.D. Candidate | Advised by Dr. Wayne Hayes
(joint with San Diego State University)

- Develop a program to pipe results from spiral arm detection software, [SpArcFiRe](#), into GALFIT to automate galactic structure parameterization.
- [SpArcFiRe GitHub Repo](#).

Dark Energy Spectroscopic Instrument Collaboration 2021-Present
Collaborator/URA Visiting Scholar | Supervised by Dr. Antonella Palmese

- Identify transients from multi-messenger sources using [DESI](#) and correlate these observations to confidence interval of gravitational wave localization maps.
- [DESIhub Time Domain GitHub Repo](#)

Lawrence Livermore National Lab 2021, 2022
Graduate Research Intern | Advised by Drs. Peter Anninos & Rob Hoffman

- Simulated hyper-accretion inflow onto the surface of neutron stars from a binary companion using [COSMOS++](#) to predict observational (x-ray and gravitational wave) signature.

ADDITIONAL PROJECTS

San Diego State University **2017-2019**
Ph.D. Candidate | Advised by Dr. Fridolin Weber
(joint with University of California, Irvine)

- Simulated hyperdense matter inside neutron stars using Fortran.

Rochester Institute of Technology **2015**
Research Experience for Undergraduates | Advised by Dr. Benjamin Sargent

- Analyzed photometry of AGB stars in the Large and Small Magellanic Clouds.

University of Texas at Dallas **2012-2016**
B.S. Physics

- Specialization in Astrophysics.

Core Mass Fraction Inference **2022**
Hack Day, [LSSTC DSFP Session 16.](#) | Northwestern University

- Infer core mass fraction of the moon using gravitation data via statistical inference.
- [GitHub Repo.](#)

Simple SPH Star Model **2022**
Hack Day, [LSSTC DSFP Session 15.](#) | Harvard University

- Simulated a simple SPH star model using object oriented methods in Python.
- [GitHub Repo.](#)

Simulate Observations of Spiral Galaxies **2022**
Hack Day, [LSSTC DSFP Session 14.](#) | University of Arizona

- Used an autoencoder neural network to simulate observations of spiral galaxies.
- [GitHub Repo.](#)

Volume Integration using Monte Carlo and Deterministic Methods **2019**
Scientific Computing Class | University of California, Irvine

- Compared the two methods to integrate over an n-dimensional cubic volume.

Smoothed Particle Hydrodynamics for Compact Stars **2018**
Parallel Computing and PDE Classes | San Diego State University

- Simulated a compact star utilizing SPH and integrated parallel processing via CUDA.
- [GitHub Repo](#)

Burgers' Equation in 2D **2017**
Computational Science Seminar | San Diego State University

- Modeled the propagation of a 2D Gaussian waveform using Burger's equation by finite differencing methods and Mimetic operators.
- [GitHub Repo](#)

AWARDS

LSSTC Data Science Fellowship (DSFP) <i>DSFP Fellow</i> Northwestern University	2021-Present
Award granted to supplement data science instruction in Astronomy.	
URA Visiting Scholars Program <i>Visiting Scholar</i> Fermilab	2021-2022
Award granted to perform collaborative research with Fermilab.	
DTEI Summer Fellowship <i>DTEI Fellow</i> University of California, Irvine	2020
Award granted for supplemental pedagogical and teaching instruction.	
Graduate G-STEM Fellowship. <i>G-STEM Fellow</i> San Diego State University	2017-2019
Award granted to provide mentorship and research opportunities.	
Research Experience for Undergraduates (REU) <i>REU Recipient</i> Rochester Institute of Technology	2015
Research award granted to perform research under Dr. Benjamin Sargent.	
Academic Excellence Scholarship (AES) <i>AES Recipient</i> University of Texas at Dallas	2012-2016
Excellence award granted for academic performance.	

PUBLICATIONS

Articles	M. Portman , S. Mesforoush, and W. Hayes (2023). "A re-assessment of SpArcFiRe's performance on toy spiral galaxies". Under review.
	M. Portman and A. Palmese (2023). "A Method to Perform Gravitational Wave Transient Follow-up with DESI". In preparation.
Posters	M. Portman and A. Palmese (2022). "Identifying Optical Counterparts From Follow-Up Of Gravitational Wave Events". ACCESS #18 .
	M. Portman (2021). "Automated Multi-Component Fitting of Light Models to Observations of Spiral Galaxies". ACCESS #17 .
	M. Portman and A. Palmese (2021). "Identifying Optical Counterparts From Follow-Up Of Gravitational Wave Events". Sustainable Horizons Institute Sustainable Research Pathways (SHI-SRP) Workshop, Virtual.
	M. Portman and W. Hayes (2019). "Physics Based Model for Spiral Arm Detection in SpArcFiRe". ACCESS #16 .
	M. Portman and F. Weber (2018). "Differential Rotation in Proto-Neutron Stars". ACCESS #15 .
	M. Portman and B. Sargent (2016). "AGB Stars in the Large and Small Magellanic Clouds". American Astronomical Society Meeting #227 . id.144.24.

PROGRAMMING LANGUAGES

Python	OpenMP
Linux/Bash	MPI
MATLAB	CUDA
C++	IDL
Fortran	L ^A T _E X

OTHER
INTERESTS

Coffee Aficionado (Home Barista)	Writing
Baking (Bread)	Film
Weightlifting	Fashion