Ezra Brooker

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EDUCATION

FLORIDA STATE UNIVERSITY
MS/PhD in Computational Science
Expected 2020/2021 | Tallahassee, FL
Cum. GPA: 3.87 / 4.0

FLORIDA STATE UNIVERSITY
BS in Physics and Astrophysics
May 2015 | Tallahassee, FL
Cum. GPA: 3.27 / 4.0
Major GPA: 3.20 / 4.0

COURSEWORK

GRADUATE

Applied Computational Science I/II
Scientific Programming
Introduction to Fluid Dynamics
Verification and Validation
Methods in Comp. Statistics I
Boundary Integral Equations Seminar
Survey of Numerical PDEs

(Instructor of Record)
Intro to Scientific Computing

(Teaching Assistant)
Comp. Methods for Discrete Problems
Applied Computational Science I
Continuous Algorithms for Science Applications
Computational Thinking
Elementary Oceanography

UNDERGRADUATE

Nuclear Astrophysics
Physics of Stars
Hydrodynamics in Astrophysics
Computational Astrophysics
Electricity and Magnetism I/II
Classical Mechanics I/II

(Learning Assistant 2x)
General Physics B

SKILLS

PROGRAMMING

Languages:
Python • Fortran • Bash
Familiar:
C/C++ • Matlab • LaTeX
Platforms:
Windows XP/7/10 • CentOS • Redhat
OpenSUSE • Mint • MacOS

EXPERIENCE

NEW MEXICO CONSORTIUM | Graduate Research Assistant
May-August 2020 | Los Alamos, NM

- Worked with **Chris Fryer** and Chris Mauney on the **Stardust project**.
- Developed data onloading routine for open source dust nucleation code
- Constructed large database of 1D dust nucleation models for core-collapse supernova ejecta.

LOS ALAMOS NATIONAL LAB | Graduate Research Assistant
June-August 2018 | May-August 2019| Los Alamos, NM

- Computational Physics Workshop: 1/23 participants (2018).
- Graduate Research Assistant (2019)
- Worked with **Chris Fryer** and Chris Mauney on the **Stardust project**.
- Studied sensitivity of cosmic dust production supernova explosion energy with 1D Lagrangian supernova Fortran code and dust nucleation Python code.
- Parallelized dust nucleation code for a speedup in model instance production.
- Implemented gas phase chemistry reaction physics in dust formation code.

ACADEMIC RESEARCH

FSU DEPT OF SCIENTIFIC COMPUTING | PhD Candidate
Sept 2017 – Present | Tallahassee, FL

- Working with **Tomasz Plewa** on Type Ia supernovae.
- Constructed database of turbulent combustion models of turbulent white dwarf plasma for Type Ia supernova explosions.
- Used hydrodynamics code FLASH and stellar evolution code MESA.
- Developed cross correlation analysis tools to study the effects of hydrodynamics on ignition.

FSU ASTROPHYSICS GROUP | Undergraduate & Post-Baccalaureate Research Assistant
Sept 2013 – July 2015 | Tallahassee, FL

- Worked with **David Collins** on large stellar formation Enzo datasets.
- Calculated local magnetic field angles of proto-stellar cores compared to mean magnetic fields of dust clouds in search of trends between local orientations and mean field strength. Link to **Honors Thesis**.
- Implemented Python routines to make synthetic observations data, e.g. magnetic field orientation calculations in cosmic dust clouds using light polarization.

AWARDS AND HONORS

2020	**Semi-Finalist**	SMART Scholarship
2019	**Semi-Finalist**	SMART Scholarship
2015	**3rd Place**	The Lanutti Award for Undergraduate Research
2015	**Honors Thesis**	Magnetic Field Angles in Collapsing Molecular Clouds

PUBLICATIONS

[1] E. Brooker, T. Plewa, and D. Fenn. Sn ia ddt explosions powered by the zeldovich reactivity gradient mechanism, 2020.