# Gillen Brown

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Recent astrophysics Ph.D. graduate with strong programming, data analysis, and communication skills with experience running and analyzing computer simulations. Proficient in Python with some experience with C. Diverse formal training encompassing mathematics, statistics, physics, and computer science.

## Education

**University of Michigan** — Ann Arbor, MI
Ph.D. Astronomy and Astrophysics — April 2022
GPA: 4.0/4.0

**University of Missouri-Kansas City** — Kansas City, MO
B.S. Physics with emphasis in Astronomy — May 2016
Minors in Mathematics and Computer Science
GPA: 4.0/4.0 (Summa Cum Laude)
**Relevant Coursework**: Calculus (I, II, III), Linear Algebra, Mathematical Statistics, Introduction to Statistical Learning, Machine Learning for Data Scientists, Data Structures (C++)

## Experience

**Graduate Student Research Assistant** — September 2016 — April 2022
*University of Michigan, Ann Arbor, MI*

- Performed astrophysics resulting in four peer-reviewed scientific publications (key projects described below)
- Used Python to analyze data of several kinds, including tables, images, and volumetric simulation data
- Ran a suite of hydrodynamical simulations of galaxy formation and analyzed the outputs
- Awarded more than 15 million CPU-hours on supercomputers including Stampede2, Anvil, and Frontera
- Presented work at local seminars, scientific conferences, and to the public (audiences from 5 to 100+ people)

## Skills

**Technical Skills**: Python (including SciPy, NumPy, Matplotlib, Jupyter, pandas, etc.), SQL, C/C++, Unix, git
**Data Analysis**: Statistics and probability, linear regression, Bayesian modeling, data visualization
**Soft Skills**: Technical writing, public speaking, critical thinking, problem solving

## Selected Projects

**Analyzing Star Clusters in Numerical Simulations of Galaxy Formation**

- Updated existing C codebase that computationally models galaxy formation to improve the modeling of star cluster formation and evolution
- Ran numerical hydrodynamical simulations of galaxy formation on the Stampede2 supercomputer, producing a 60TB dataset of volumetric data
- Developed an automated Python pipeline to process this data and extract relevant galaxy properties
- Analyzed this dataset to understand how star clusters form as galaxies grow, resulting in two peer-reviewed publications
- In total, I have six years of experience analyzing simulations and four year of experience running my own

**Radii of Star Clusters**
*github.com/gillenbrown/LEGUS-sizes*

- Used a Bayesian model to measure the radii of star clusters seen in Hubble Space Telescope images
- Successfully measured the radii of over 6,000 star clusters, more than all previous studies combined
- Performed some exploratory analysis of these radii with the goal of understanding how star clusters form and evolve, finding that more massive clusters form with larger radii and expand slightly with time
- Presented results and made the data publicly available in a peer-reviewed publication, which has been cited by 23 other scientific publications in less than two years

**Astronomy Citation Manager Application**
*github.com/gillenbrown/library*

- Developed an application that allows users to manage the astronomy papers that they want to read and cite
- Uses Python, Qt for the GUI, and SQLite for the local database