KATHERINE (KATIE) CHAMBERLAIN, PH.D.

github: katiechambe • LinkedIn: katiechambe

email: chambe.katie@gmail.com • phone: +1 406-465-5814

PROFESSIONAL OVERVIEW:

Astrophysicist, applied statistician, and doctoral researcher transitioning to industry. Experienced using Python to create value and drive projects forward. Comfortable working individually and collaboratively. Seeking data science and research science roles with a focus on data exploration, machine learning/AI, and statistical modeling.

TECHNICAL SKILLS:

Tools: Python (conda), Git/Github, CI/CD, SQL, Sphinx Documentation
Analysis: machine learning, Bayesian inference & MCMC, experimental design
Packages: Pandas, scikit-learn, numpy
Computing: High performance & distributed computing (SLURM, PBS), Experience with AWS (Certification received Fall 2024), numerical simulation, optimization
Project Management: Familiar with Kanban & Agile/Scrum

EXPERIENCE:

Doctoral Researcher — *University of Arizona, Tucson AZ* **Aug 2018 — Present**

- **Doctorate received** May 2024. Collaborative research ongoing.
  - Authored four peer-reviewed papers (three as first author). Delivered >20 technical presentations.
- Established a revolutionary framework to permit accurate comparisons between observational data and simulations for rigorous tests of fundamental physics.
  - Performed extensive data exploration via visualization to uncover complex relationships between galaxy properties.
- Built machine learning models (regression) in Python to increase scientific value of legacy data catalogs
  - Trained models to predict 3D galaxy separations given 2D observational measurements without the cost of performing additional time-consuming and expensive observations.
- Refactored software and utilized high performance computing clusters to improve runtime for frequently performed ETL processes from >1 day to ~ 3 minutes, decreasing time-to-delivery of data catalogs.
  - Reduced large astrophysics simulations (>100 TB) to scientific catalogs of galaxies and dark matter halos.
  - Wrote a production-grade Python package for use by collaborators hosted on github here.
- Utilized statistical inference to constrain properties of nearby galaxies using dynamical measurements, decreasing uncertainty by a factor of two over previous methods and creating predictions for uncertainty improvements from future observations.

Undergraduate Researcher — *Montana State University, Bozeman MT* **June 2015 — August 2018**

- Employed statistical models to predict future constraints on deviations from General Relativity with future gravitational wave detections, results of which used as a compelling science case for increased funding from national funding agencies.
  - Resulted in three peer reviewed papers (two as first-author) and a dozen technical presentations.
- Created gravitational waveform templates and modeled observables, leading to the first frequency-domain models for moving black hole binary mergers to improve future tests of General Relativity.
  - Selected for 2017 Summer Undergraduate Research Fellowship at Caltech.
- Established peer-led coding courses as President of the Society of Physics Students

EDUCATION:

Doctor of Philosophy (PhD), Astronomy & Astrophysics **2024**
University of Arizona, Steward Observatory, Tucson AZ

Bachelor of Science (BS), Physics and Mathematics w/ Honors **2018**
Montana State University, Bozeman MT