Locke Patton

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Education

Harvard University — **Cambridge, MA**
Masters in Astrophysics | Pierce Fellowship — *2018–2021*

University of Washington — **Seattle, WA**
Bachelor of Science in Physics & Astronomy — *2015–2018*

Portland State University | Portland Community College — **Portland, OR**
Early College Student | PSU Dean's List — *2012–2014*

Awards

Pierce Fellowship: Harvard University — *2018-2021*
Prestigious scholarship awarded to the applicant demonstrating extraordinary promise

John P. and Carol J. Merrill Graduate Fellowship: Harvard University — *2019*

Chambliss Astronomy Achievement Graduate Award: American Astronomical Society — *2019*

UW Mary Gates Research Scholar: Two-time Winner — *2016*

Relevant Experience

Harvard PhD Program | Graduate Student in Astrophysics — **Cambridge, MA**
Conducted independent research project for Masters dissertation — *Fall 2018 – Fall 2021*

- Used Python to distill disparate photometry data sources into json model-ready format of my own design
- Developed slurm and Python non-parametric Bayesian nested sampling models of >200 galaxies on Cannon high performance computing cluster, personally using 100,000+ computing hours
- Extracted results using linear regression in Python, calculated parameters and interpreted Bayesian results from hundreds of 100 MB json files
- Interpreted resulting population statistics for the complete set of superluminous supernovae type I host galaxies

Final Project | MCMC Parameter Estimation Model — **Cambridge, MA**
'Data Analysis for Physicists' Graduate Course — *2020*

- Constructed Bayesian and frequentist inference and parameter estimation modeling Python code from scratch
- Utilized git version control to collaboratively implement Markov-chain Monte Carlo rotation model of black hole event horizon images
- Hierarchical Bayesian models final project

Harvard University Teaching Fellow — **Cambridge, MA**
Course: Methods of observational astronomy — *Fall 2018 – Fall 2021*

- Used skills in bash, data analysis, modeling, GitHub and pip to teach first time Python learners
- Developed lesson plans and wrote example Python workflows
- Mentored six students through unique astronomy science research coding projects while working remotely

Undergraduate Research Projects — **Seattle, WA**
Prof. Emily Levesque, Prof. Jessica Werk at University of Washington — *Fall 2016 - 2019*

- Designed, coded, implemented and published *sonipy* package in Python, a sonification tool to help blind and visually impaired individuals access data
- Reverse-engineered `C++` code into Python package for membership determination in stellar clusters

Programming & Skills

Python: pandas | numpy | matplotlib | os | json | emcee | dynasty | Jupyter | astropy

High Performance Cluster computing: slurm | modules | partitions

Technical Competency: Bayesian inference | Git Workflow | Machine learning | Package development | TDD

Additional Languages: Bash scripting | SQL | Beginner Java | Mathematica | Latex | `C++` | Scikitlearn

Data Analysis: Bayesian and Frequentist Inference | Markov-chain Monte Carlo

Foreign Languages: Basics of French, Spanish, Thai, and Japanese