+1 (202) 643-3163
Cambridge, MA
iweaver@mailbox.org

Ian Weaver, Ph.D.

Data Scientist / Junior Developer

Portfolio: icweaver.github.io
github.com/icweaver
linkedin.com/in/icweaver

Experience

Harvard Science Center **Jan 2017 — Present**
The Center for Astrophysics | Harvard & Smithsonian (CfA) *Cambridge, MA*
- Operated and maintained the 0.4 meter Clay Telescope atop the Harvard University Science Center.
- Hosted star parties and other outreach events for the undergraduate and local community.

Graduate student researcher **Sep 2016 — May 2022**
The Center for Astrophysics | Harvard & Smithsonian (CfA) *Cambridge, MA*
- Provided spectroscopic time-series observations and follow-up atmospheric analysis for an underrepresented class of exoplanet.
- Accomplished this using Gaussian process (GP) and principal component analysis (PCA) detrending techniques, combined with Bayesian inference frameworks including Markov chain Monte Carlo (MCMC) and nested sampling.
- Utilized high performance computing facilities and schedulers (Torque/PBS, SGE, slurm) via ssh and the command line on different Linux operating systems.
- Taught/mentored several undergraduate courses in Astronomy and received multiple teaching awards.

Co-Instructor **Jun 2017 — Sep 2019**
Banneker Institute *Cambridge, MA*
- Collaborated in the design and execution of a novel summer astronomy workshop through the ISEE Professional Development Program geared towards underrepresented students in STEM.
- Taught 20+ class size emphasizing hands-on and inquiry based learning.

Technical skills

Programming and computation: Python, Julia, Plotly, Bokeh, JavaScript, HTML/CSS, Linux, Bash, LaTeX, Markdown
Tooling: CI/CD workflows, Git, GitHub, make, rclone, Google Cloud Platform, ssh, SQL (ADQL), Table Access Protocol (TAP)
Statistics: Bayesian inference, Nested sampling, MCMC, Variational inference, Stochastic gradient descent, Simulated annealing

Projects

JuliaAstro [link] **2020 – Present**
Contributor and member of the Julia astronomy organization
- Designed the Keplerian orbit capabilities for the transit modeling package, Transits.jl [link], which uses automatic unit and integration testing via GitHub Actions, supports Python interoperability, and produces competitive benchmark performance.
- Implemented several dust extinction models for the interstellar medium observations package DustExtinction.jl [link], which provides first-class support for measurements containing units and estimated uncertainties.

Team member, Graduate course final project [link] **Fall 2019**
Python implementation for new algorithm estimating MCMC uncertainty
- Addressed limitations in current definition of the $\hat{R}$ statistic by implementing a new algorithm proposed by Veharti et al. (2019).
- Packaged this deliverable as a set of Jupyter notebooks, including comprehensive documentation, example usage, and sample figures with associated npy and pickle data sets.

Team member, Graduate course final project [link] **Fall 2018**
Python package for differential equation solving, powered by automatic differentiation
- Operated and maintained the 0.4 meter Clay Telescope atop the Harvard University Science Center.
- Hosted star parties and other outreach events for the undergraduate and local community.

Education

Doctor of Philosophy (Ph.D.) in Astronomy, Graduate School of Arts and Sciences, *Harvard University* **May 2022**
Master of Arts (AM) in Astronomy, Graduate School of Arts and Sciences, *Harvard University* **May 2020**
Bachelor of Arts in Astronomy and Astrophysics, Division of Physical and Biological Sciences, *UC Santa Cruz* **May 2016**

Relevant graduate coursework: Advanced Scientific Computing: Stochastic Methods for Data Analysis, Inference and Optimization, Systems Development for Computational Science, Noise and Data Analysis in Astrophysics

Activities and Outreach

Graduate School of Arts and Sciences Crew Team **2016 — 2022**
Co-Director of science outreach program Open Labs at Harvard (OLAH) [link] **2018 — 2020**
Graduate Student Council Representative **2016 — 2018**
Eagle Scout, Troop 255 **2012**