

Anthony Burrow, Ph.D.

✉ anthony.r.burrow@gmail.com
in [linkedin.com/in/anthony-burrow](https://www.linkedin.com/in/anthony-burrow)
🏠 anthonyburrow.github.io

SUMMARY

Research scientist with a Ph.D. in Physics and a robust background in applying machine-learning concepts to complex datasets in astrophysics. Extensive work utilizing Python, C/C++, and more to develop software tools which have shown to be significant contributions to the scientific community. Experienced with the entire data science life cycle: identifying problems, data wrangling, and model deployment, evaluation, and maintenance.

TECHNICAL SKILLS

Programming:

Python, SQL, C/C++, C#, Bash

Platforms:

Linux/UNIX, Windows

Technologies:

Git, JupyterLab, RStudio, L^AT_EX, Slurm

Experience with Python Libraries:

NumPy pandas scikit-learn matplotlib SciPy Astropy Tensorflow GPy

Data Science Skills:

Data Wrangling Statistics Data Analysis Data Visualization Model Evaluation Automation
Regression Classification Parameter Optimization Cluster Analysis Dimensionality Reduction

RESEARCH EXPERIENCE

- Graduate Research Assistant** July 2019 – Present
University of Oklahoma, Advised by Dr. Eddie Baron *Norman, OK*
 - Develop **Python** software to implement **machine-learning** techniques to **model** the behavior of supernovae.
 - Perform thorough **preprocessing**, **standardization**, and **feature engineering** of spectroscopic data.
 - Conduct detailed **statistical analyses**, resulting in two **publications** in a peer-reviewed journal (ApJ).
 - Collaborate** with leading researchers from several other universities and facilities around the world (CSP, POISE).
 - Present** results to peers and collaborators at meetings and conferences.
 - Synthesize models** in a **supercomputing** environment with **Slurm** scripts using PHOENIX radiative transfer code.

Products:

 - [Burrow, Anthony, et al. \(2024\)](#). *Extrapolation of Type Ia Supernova Spectra into the NIR Using PCA*. ApJ
 - [Burrow, Anthony, et al. \(2020\)](#). *Carnegie Supernova Project: Classification of Type Ia Supernovae*. ApJ
 - [SNEx](#) (Python): Spectrum **extrapolation** into near-infrared wavelengths using **principal component analysis**.
 - [Spextractor](#) (Python): Fast spectrum-smoothing using **Gaussian process regression**.
 - [SNIaDCA](#) (Python): Wrapper for probabilistically **classifying** supernovae with **Gaussian mixture models**.
- Undergraduate Research Assistant** June 2015 – May 2017
University of Oklahoma, Advised by Dr. John Wisniewski *Norman, OK*
 - Calibrated** observed data by removing multiple sources of noise from raw **FITS** images of stars using **IRAF**.
 - Modeled** the observed light profile of stars on images using **IRAF** to calculate their brightness values.
 - Created Python and IDL scripts needed to **analyze data** and propagate errors derived from observations.
 - Conducted multiple remote **observations** at the Apache Point Observatory to obtain more raw data for analysis.
 - Presented results** at the American Astronomical Society conference.