Anthony Burrow, Ph.D.

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EDUCATION

- **Ph.D. in Physics**; GPA: 3.92   Aug. 2019 – July 2024
  University of Oklahoma; Dissertation on SHAREOK   *Norman, OK*

- **Professional Certificate, Data Science**   July 2024 – Present (*Expected Aug. 2024*)
  IBM

- **B.S. in Astrophysics**; GPA: 3.91   Aug. 2014 – May 2017
  University of Oklahoma   *Norman, OK*

TECHNICAL SKILLS

Programming:	**Platforms**:	**Technologies**:
Python, SQL, C/C++, C#, Bash, Fortran, IDL, Makefiles, CMake	Linux/UNIX, Windows	Git Version Control, JupyterLab, RStudio, LaTeX, MS Office, Mathematica, IRAF

Experience with Python Libraries:

NumPy	SciPy	scikit-learn	Astropy	Tensorflow	pandas	matplotlib	GPy

Data Science Skills:

Machine Learning ∘ Data Analysis ∘ Data Visualization ∘ Cluster Analysis ∘ Classification
Statistics ∘ Regression ∘ Predictive Modeling ∘ Optimization ∘ Interpolation & Extrapolation
Numerical Computation ∘ Software Development ∘ Unit Testing ∘ Debugging ∘ Automation

RESEARCH EXPERIENCE

- **Graduate Research Assistant**   July 2019 – Present
  University of Oklahoma, Advised by Dr. Eddie Baron   *Norman, OK*

  - **Develop Python software** to implement several **machine-learning** techniques to **model** the behavior of SNe Ia.
  - Perform **statistical analyses**, resulting in two **publications** that illustrate the effectiveness of my results.
  - **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 the near-infrared using principal component analysis.
  - Spextractor (Python): **Fast spectrum-smoothing** using Gaussian processes; spectrum **preprocessing**.
  - SNIaDCA (Python): Wrapper for SNe Ia probablistic **classification** with Gaussian mixture models.

- **Undergraduate Research Assistant**   June 2015 – May 2017
  University of Oklahoma, Advised by Dr. John Wisniewski   *Norman, OK*

  - **Reduce** observed data by removing multiple sources of noise from raw FITS images of star clusters using IRAF.
  - **Model** and fit the observed light profile of stars on images using IRAF.
  - Create Python and IDL scripts needed to **analyze data** and propagate errors derived from observations.
  - Conduct multiple remote **observations** using the 0.5m ARCSAT telescope at the Apache Point Observatory.
  - Present results at the American Astronomical Society conference.