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Kara A. Ponder

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Employment

Data Science Fellow **University of California Berkeley** **September 2017 – Present**

- Postdoctoral Researcher at the Berkeley Center for Cosmological Physics under Saul Perlmutter.
- Maintained a data reduction pipeline hosted on a high performance computing center.
- Explored data science and machine learning for science with the upcoming Large Synoptic Survey Telescope.

Research Assistant **University of Pittsburgh** **January 2013 – August 2017**

- Modeled systematics with Bayesian/Hierarchical Bayesian frameworks and explored data correlations with regression for supernova cosmology.
- Headed the SweetSpot Survey observing near infrared supernovae.

Technical Experience

Select Projects

- **Data-Driven Approach to Mock Galaxy Catalogs** (2019). Executed Time Series K-means clustering on galactic observations to assign galaxies in simulations realistic characteristics. Python
- **Supernovae and Galaxy Correlations** (2019). Determined the statistical significance of a correlation between Type Ia Supernovae in the near infrared and their host galaxies using model regression. Python
- **PLAsTiCC Astronomical Classification on Kaggle** (2018). Validated the simulations through many visual, distribution, and physical tests to minimize data leaks. Python
- **Bayesian Modeling of Systematics** (2016). Implemented a Gaussian Mixture Model in a Bayesian framework to determine biases on cosmological parameters from missing data correlations. Python on HPC center.
- **Analysis of Populations of FRBs** (2015). Investigated several unsupervised learning techniques on a sample of Fast Radio Bursts to explore number of populations to later predict how many FRBs were needed to confirm multiple populations. Python

Education

Pittsburgh, PA **University of Pittsburgh** **August 2012 – August 2017**

- Ph.D. in Physics, August 2017.
- M.S. in Physics, April 2014.
- Relevant Coursework: Computational Methods in C++, Astronomical Techniques (strong focus on statistics).
- Co-President of the Association of Physics and Astronomy Graduate Students

Athens, GA **University of Georgia** **August 2009 – May 2012**

- B.S in Physics and Astronomy, May 2012.
- Relevant Coursework: Computational Physics in Fortran.
- Awarded the Linville L. Hendren Memorial Scholarship for Outstanding Proficiency in Physics

Languages and Technologies

- Python (expert); Git (proficient); Unix (proficient); CVS (proficient); SQL (prior experience); C++ (prior experience); C (prior experience); Fortran (prior experience);
- Python Packages: Numpy, Scipy, Matplotlib, Scikit-learn, Pandas, Django (with PostgreSQL), PyStan, emcee

Skills

- Data Visualization, Model Fitting, Data Manipulation and Cleaning, Image Processing, Machine Learning
- Working in Collaborations and Independently, Communication, Creative Thinking