

Alan Pearl

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Personal Statement

Postdoctoral researcher in Astrophysics, seeking to bring my wide skillset to a career in data science. I have over 8 years of experience in scientific software development, algorithm derivation and implementation, big data analysis, relational database queries, Bayesian inference, machine learning, and data visualization. I am the lead developer of several open-source software projects: 🌐 difft, 🌐 galtab, 🌐 JaxTabCorr, and 🌐 mocksurvey. I look forward to undertaking new data science challenges while continuously building new domain knowledge.

Experience

Postdoctoral Researcher

Sep 2023 - Present

Argonne National Laboratory, Lemont, IL

- Developed generative models of galaxy populations using machine learning, allowing my team to perform cosmological inference without requiring a million-CPU-hour simulation per evaluation
- Parallelized parameter optimization on GPU, utilizing our high-performance computing resources, enabling nearly limitless scalability of our models and up to 100x faster training times

Graduate Student Researcher / Teaching Assistant

Sep 2017 - Aug 2023

University of Pittsburgh, Pittsburgh, PA

- Generated galaxy data catalogs through machine learning and developed new spatial clustering statistics that produced some of the most significant evidence to date of galaxy assembly bias
- Clear communication: Led recitations for various courses and advised an undergraduate research project

Education

University of Pittsburgh – Pittsburgh, PA

2017 - 2023

Ph.D. Physics – Thesis: *Illuminating and Tabulating the Galaxy-Halo Connection*

Summer 2023

M.S. Physics, GPA: 3.89

Dec 2018

Rensselaer Polytechnic Institute – Troy, NY

2013 - 2017

B.S. Physics, magna cum laude, GPA: 3.75

May 2017

Technical Skills

Primary Language:	Python (<i>over 8 years of scientific software development</i>)
Python Packages:	NumPy, Jax, Pandas, mpi4py, Scikit-Learn, TensorFlow, SpaCy, LangChain
Secondary Languages:	C++, C#, Cython, MATLAB, HTML, SQL, Mathematica, IDL
Operating Systems:	Windows (with WSL), Linux (Ubuntu)
Other tools:	Slurm, Git, GitHub CI, VS Code, Docker, DVC, debuggers (gdb, pdb)

First-Author and Advisee Publications

Dec 2024	Pearl, Alan N.; Beltz-Mohrmann, Gillian D.; Hearin, Andrew P. 2024, JOSS, 9 (104), 7522.
Mar 2024	Pearl, Alan N.; Zentner, Andrew R.; Newman, Jeffrey A.; et al. 2024, ApJ, 963, 116
Jan 2024	Steel, Cecilia; Pearl, Alan N.; Kaushal, Yasha; Bezanson, Rachel 2024, RNAAS, 8, 16
Feb 2022	Pearl, Alan N.; Bezanson, Rachel; Zentner, Andrew R.; et al. 2022, ApJ, 925, 180P
Oct 2017	Pearl, Alan N.; Newberg, Heidi Jo; Carlin, Jeffrey L.; Smith, R. Fiona 2017, ApJ 847, 123P

Professional Reference

Andrew Hearin ✉ ahearin@anl.gov – current supervisor at Argonne National Laboratory