Rhys Shaw

PhD Student in Astrophysics

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Experience

Data Science Intern   *2024*
Aleph Insights, London

Worked on building a internal LLM client tool. This interacted with any LLM API, stored all data locally and allowed for attaching relevant documents from local the network. This required building a full-stack web application, for which we used FastAPI, HTMX for website front and backend. All data was held within a MongoDB.

Postgraduate Teaching Assistant   *2026*
University of Bristol, Bristol, England

Lab demonstration, assisting 2nd year undergraduates in completing their research projects. This required a detailed working knowledge of a number of physics experiments. I then accesed them through interviews and marking reports.

Other Experience

DataAid Commitee Member   *2024-2025*
DataAid, Bristol

DataAid is a yearly student-led hackathon that aims to provide data science support to charities and non-profit organizations. As a committee member, I am responsible for helping to organize events, selecting charities that we are able to help on a technical level, as well as providing technical support to the hackathon.

Astrophysics Developer Group co-Lead   *2025-2026*
University of Bristol, Bristol

I am co-lead of the Astrophysics Developer Group at the University of Bristol. This an open group of PhD students and Academics that meet weekly to discuss software development in their research. This includes discussing wins and issues that are coding related with a small talk/tutorial each week about a specific topic. I have given talks on basic Web-developement, parallelisation and self-hosting.

Projects

Stilts-nli   *View Project*

A Natural Langauge interface to the Astrophysics software STILTS. This project consists of a cli user interface that makes calls to a finetuned open-source langauge model.

DRUID   *View Project*

One of my PhD projects, DRUID is a python package that preforms source finding on astronomical images using persistent homology.

Personal Website   *View Project*

My personal website, built using FastAPI and HTMX hosted on my self-hosted server.

HomeLab

A self-hosted server that runs a number of services including my personal website, an Immich cloud photo storage, a Zotero WebDAV cloud and a number of others.

Publications

Collaboration, E., Zatarain, T. M., Fotopoulou, S., Ricci, F., Bolzonella, M., Franca, F. L., Viitanen, A., Zamorani, G., Taylor, M. B., Mezcua, M., Laloux, B., Bongiorno, A., Jahnke, K., Stevens, G., Shaw, R. A., Bisigello, L., Roster, W., Fu, Y., Margalef-Bentabol, B., … Soubrie, E. (2025, March). *Euclid Quick Data Release (Q1). The active galaxies of Euclid.* arXiv. https://doi.org/10.48550/arXiv.2503.15320

Shaw, R. A., Fotopoulou, S., Birkinshaw, M., Maddox, N., & Stewart, H. (2025). DRUID: source detection and deblending in astronomical images with persistent homology. *RAS Techniques and Instruments, 4,* rzaf6. https://doi.org/10.1093/rasti/rzaf006

Summary

Final year Astrophysics PhD Student at the University of Bristol, with a experience in Machine Learning, Data Analysis and software engineering.

Education

PhD in Astrophysics   *2026*

Machine Learning and Analysis Techniques for Extra-Galactic Sources.

University of Bristol, Bristol

MSc Data Intensive Astrophysics   *2021*

The Effect of fractal substructure in early stellar cluster evolution.

Cardiff University, Cardiff

BSc Physics with Astrophysics   *2020*

Exploring the bias in X-ray and SZ selected galaxy clusters using scaling relations.

University of Bristol, Bristol

Awards

AIMLAC CDT PhD Studentship   *2022*

University of Bristol

Awarded a fully funded PhD studentship from the AIMLAC CDT at the University of Bristol.

BSc Research Project Commendation   *2020*

University of Bristol

Commendation for my BSc research project on the bias in X-ray and SZ selected galaxy clusters using galaxy cluster scaling relations.

Skills

Programming languages

Python JavaScript Fortran C++ Rust

AI/ML

Pytorch TensorFlow HuggingFace Transformers

Tools

Linux Git

Docker   HPC

MongoDB   HTMX

FastAPI