Rhys Shaw

PhD Student in Astrophysics

Bristol, UK

linkedin.com/in/rhysalfshaw

rhysalfshaw.com

rhysalfshaw@gmail.com

github.com/RhysAlfShaw

0000-0003-4318-0737

Experience

Data Science Intern   2024-09-01

Aleph Insights, London, England

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.

Postgraduate Teaching Assistant   2022-06-01

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 experiements projects. I then accesed them through conducting interviews and marking formal reports.

Other Experience

DataAid Commitee Member   Date

Company, Location

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   Date

Company, Location

I am a co-lead and organiser 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 and a small talk/tutorial each week about a specific topic. Personally I have given talks on basic Web-developement, parallelisation and self-hosting.

LOC member for 2025 Simulation Based Inference for Galaxy Evolution Conference   Date

Company, Location

I was a member of the local organizing committee for a small conference in Bristol. This was focused on Simulation based inference in astrophysics. I help chair dicussions and assisted in the running of the conference.

Projects

StiltsAgent   *View Project*

A LLM agent that helps generate commands for the Astrophysics software STILTS. This is a command line tool that is used to manipulate and analyse large

Summary

Third Year Astrophysics PhD Student at the University of Bristol, with a focus on Machine Learning and Computing.

Education

PhD in Astrophysics   2026

University of Bristol, Bristol

Master of Science in Data Intensive Astrophysics   2021

Cardiff University, Cardiff

Bachelor of Science in Physics with Astrophysics   2020

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
LaTex   Fortran
C++   Rust
Typst

AI/ML

Pytorch   TensorFlow
HuggingFace   Transformers

Tools

Linux   Git
Docker   HPC

astronomical datasets. This agent can interact with the STILTS documentation using a Retreval augemneted generation (RAG) approach and has a fine-tuned light-weight LLM to generate reliable commands.

MongoDB   HTMX   FastAPI

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   *View Project*

An ongoing project of mine is my home lab. 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. This is all run on a single server with a number of docker containers.

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