Samuel Hinton

Data Scientist | Astrophysicist | Software Engineer

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Summary

I'm a data scientist and data engineer with a focus on energy markets, forecasting, and increasing the uptake of renewable energy sources. I have over a decade of experience in industry, and years of experience within academia. I have architected, designed, built, and deployed end-to-end machine learning pipelines, data pipelines, and mission-critical software services for both academia and industry.

Experience

Research Fellow – *University of Queensland* 2025

- Ran workshops and seminars on numerous topics with a focus on upskilling PhD students with industry tooling, such as containerisation, project management, dependency management, coding practising, and orchestration tooling.
- Worked with the Schmidt Foundation in the United States to reduce fragmentation of data repositories and collections in astronomy.
- Provided proof-of-concept modern data reduction pipelines for adoption in upcoming space telescope surveys and reimplemented existing data reduction and science pipelines to bring them up to industry standards and modern tooling.

Senior Data Scientist – *Arenko* 2020 – 2025

- Implemented **MLOps** pipelines in AWS, including feature store, model versioning (mlflow), and model serving.
- Productionised **probabilistic time-series forecasting** models for UK energy markets.
- Implemented a company-wide datalake, including data standards, ingestion, processing, and orchestration (Prefect), sending data into RDMS systems (Postgres) and cost-effective data lakes (S3, Athena, Lambda, Glue).
- Provisioned infrastructure using CICD controlled infrastructure as code (Terraform, Docker, AWS).
- Implemented a wide variety of forecasting algorithms, including gaussian processes, deep learning models, temporal models like GRU and LSTM, plus simpler statistical models.
- Created interactive **visualisations** of market opportunities (`matplotlib`, `plotly`, Dash, Streamlit).
- Mentored junior data scientists and helped grow the data science team.
- Liaised with academic and industry partners as part of the UK government's power grid digitalisation taskforce.
- Created optimisation algorithms for trading energy, catering to a discontinuous, stochastic surface using a combination of particle swarm, genetic algorithms, and Monte-Carlo simulations.
- Contributed to multiple open source projects, including `mlflow`, `cloudpickle`, `pandas` and `scipy`.
- Created and maintained my own open-source libraries, including documentation, testing, example galleries, and rigorous code quality.

Lead Data Analyst – *COVID-19 Critical Care Consortium* 2020 – 2021

- Technical lead for the COVID-19 Critical Care Consortium.
- Created the data pipeline to automatically produce machine-learning-ready data products for use in the study.
- Created reports for clinical staff and hosted a dashboard for use in hospital sites to provide

Postdoctoral Researcher – *University of Queensland* 2019 – 2020

- Research in the areas of supernova cosmology and large scale structure, focusing heavily upon analysis pipelines and systematics control through efficient use of simulations and mocks.
- Implemented and integrated probabilistic classification of our photometric imagery of supernovae.
- Implemented model fitting algorithms for pathological high-dimensional posterior surfaces.
- Increased time-efficiency of cosmological analyses by two orders of magnitude through HPC and automation.
- Created a generalised BAO fitting program (Barry) that has been used by numerous surveys and publications.

Course Instructor – *SuperDataScience* 2019

- Created a course on statistical analysis in Python for students. Focused on applied statistics and utilisation of modern code packages, with attention given to visual output and workflows for continuous validation of methodology.
- Created a course on utilising pandas for data cleaning, manipulation, and analytics.

Research Fellow – *Lawrence Berkeley National Laboratory* 2016, 2017
- Research fellowship to work on Bayesian Hierarchical Modelling and its applications to Supernova Cosmology.
- Investigated how to use high dimensional hierarchical models to model individual supernova instead of populations to provide better constraints on cosmology using supernova discovered by the Dark Energy Survey.

Research Studentship – *Gemini & Australian Astronomical Observatory* 2015 – 2016
- Utilised photometric data of Maffei 1 to determine globular cluster candidates and their properties for spectroscopic follow-up.
- Utilised data reduction pipelines, automated analysis methods in Python, and applied machine learning techniques to perform object classification.

Software Developer – *GBST* 2010 – 2014
- Developed business intelligence reporting solutions to visualise complex financial data.
- Designed and developed server and client based web application code for both frontoffice and backoffice staff.
- Created large scale SQL queries, optimised queries, databases and applications for network, processing and memory constraints.
- Developed back-end server code and front-end web applications.

Education

University of Queensland *Brisbane, Australia*
Bachelor in Software Engineering *Mar 2010 – Nov 2014*

University of Queensland *Brisbane, Australia*
Doctorate of Philosophy in Astrophysics *Mar 2015 – Nov 2019*

Notable Awards

Lindau Nobel Laureate Delegate – *Australian Academy of Science* 2019

Future Superstar Award – *University of Queensland* 2019

Bok Prize – *Astronomical Society of Australia* 2016

Australian Postgraduate Award – *Australian Government* 2016

Science Faculty Graduate of the Year – *University of Queensland* 2016

Australian Institute of Physics Prize – *University of Queensland* 2016

University Medal (Science) – *University of Queensland* 2016

Australian Gemini Undergraduate Summer Studentships – *AAO* 2015

AAO Honours Scholarship – *Australian Astronomical Observatory* 2015

University Medal (Engineering) – *University of Queensland* 2015

Communication

Industry Guest – *Energy Systems Catapult* 2022
Presented on the intersection between academia and industry and the current challenges facing both parties, and explored solutions to increase collaboration.

Industry Guest – *CodeHers* 2021
Gave workshops and presentations to highschool students on coding, machine learning, and careers in STEM.

Interviewed Data Scientist – *SuperDataScience Podcast* 2021
Participated in multiple SDS podcast episodes about topics in data science, from hypothesis testing to MLOps.

Scientific Correspondent – *CNET, CBS* 2020
Acted as a scientific correspondent for multiple organisations to break down complicated scientific research into everyday terms.

Coding@Home Industry Partner – *Queensland Education, Coding@Home* 2020
Shared the modern and future role of coding and machine learning from the perspective of an astronomer and scientist.

FameLab National Finalist – *British Council* 2020
National finalist in the FameLab program, with topic "Can you hear the Big bang?"

Science Friction Guest – *ABC Radio National* 2020
Discussed the huge transition from astrophysics to data analytics due to the COVID-19 pandemic, and the transferable skillset that science gives you.

NYSF Guest Panelist – *National Youth Science Forum* 2020
Shared my personal journey in science outreach, and presented on how to give effective presentations.

ScopeTV Guest Scientist – *ScopeTV, Channel 10* 2017 – 2019
Helped script, narrate and appear in ScopeTV educational astronomy episodes.

Science Says! Scientific Panelist – *World Science Festival* 2019
Panel scientist for Science Says, a comedy science show for Brisbane's World Science Festival.

Probably Science Podcast Guest Scientist – *Probably Science Live Podcast and Comedy Show* 2019
Guest scientist for Probably Science, joining the previous guests of Neil deGrasse Tyson, Sean Carroll and more.

2SER Radio Scientific Correspondent – *Radio, 2SER* 2019
Monthly scientific and astronomy updates.

Podcast Host – *Commuting the Cosmos* 2018 – 2019
Hosted and presented on a podcast about various space related concepts.

Curious Kids Writer – *The Conversation* 2018
Consulted and authored articles for The Conversation's Curious Kids program.

BrisScience Presenter – *BrisScience & UQ* 2018
Invited to talk at the monthly BrisScience event on the dark side of the universe.

Australian Survivor Invited Contestant, Academic Champion – *Endemol Shine* 2018
Cast as the academic champion for the 'Champions v. Contendors' season of Australian Survivor.

School Guest Presenter – *Clayfield College, Gumdale State School* 2017 – 2018
Talks to primary and secondary students on astronomy, science, STEM and career pathways.

Science Communicator – *Pint of Science, Physics in the Pub* 2017 – 2019
Gave public talks to a general audience about various topics in astronomy.

Invited Presenter – *Research Education and Development Retreat* 2017
Invited presenter at a progressional development program for physics PhD, honours and undergraduate students.

Workshop Organiser, Host and Presenter – *CAASTRO Code Workshop* 2017
Created and presented a code workshop focusing on open-source science run across Australia.

Battle of the Brains Panel Scientist – *National Science Week* 2017
Invited participant in a games panel discussion for physicists during National Science Week.

World Science Festival Tour Guide – *Queensland Museum & UQ* 2017
Scientific tour guide for the Large Hadron Collider exhibit during the World Science Festival.

FameLab Australia Scientist – *British Council* 2017
State finalist FameLab scientist. Public communication through radio interview and stage presentation.

Guest Scientist, An Evening with Dr Lisa Randall – *ThinkInc* 2016
Gave the opening speech for the Brisbane event, talking about the exciting future of astronomy.

UQ Science Demo Troupe Member – *University of Queensland* 2016
Joined the UQ Science Demo troupe to create resources for the group and participate in UQ demonstrations.

Uluru Astronomer in Residence – *CAASTRO* 2016
Accompanied Sky Tours to answer scientific questions from the public and gave public lectures on popular astronomy topics.

Publications

I am an author on over 300 published articles, with the astronomy subset available through **NASA ADS**. My medical publications via the Covid 19 Critical Care Consortium will not be indexed by NASA, but can be found on my **Google scholar profile**.

Using summary statistics from SciVal, my Field-Weighted Citation Impact is 3.63 with 52.5 average citations per publication. My current h-index sits at 72, i10-index at 224, and my highest-cited first-author paper has 340 citations.

In both astronomy and medicine, large collaborations often publish key findings with the collaboration as first author, or using an alphabetical author scheme. I am an author on eleven of these papers, with a combined citation count of ~4.3k.