Samuel Hinton

PhD Candidate, samuelreay@gmail.com

Education

2016–Now **Doctor of Philosophy** — University of Queensland
Analysing supernovae in the Dark Energy Survey using Hierarchical Bayesian models to help constrain the nature of dark energy.

2010–2015 **Bachelor of Science** (Physics)(Hons, 1st) — University of Queensland
Thesis: Analysed the Baryon Acoustic Oscillation signal imprinted in the large scale structure of the universe using the WiggleZ survey. Won the Astronomical Society of Australia's award for best Australian Astrophysics honours thesis of the year.

2010–2014 **Bachelor of Engineering** (Software)(Hons, 1st) — University of Queensland
Thesis: Created the first online client-only web-application to compute redshifts from telescope spectra. Won the GroudProbe prize, IEEE student thesis prize and IET student prize.

Experience

2017, 2016 **Lawrence Berkeley National Laboratory** — Berkeley, California
Research Fellowship
Research fellowship to work on Bayesian Hierarchical Modelling and its applications to Supernova Cosmology. Specifically, investigating 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.

2015–2016 **Gemini & Australian Astronomical Observatory** — La Serena, Chile
Research Intern
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.

2010–2014 **GBST** — Brisbane, Queensland, Australia
Software Developer
Developed business intelligence reporting solutions, designing and developing server and client based web application code, creation of large scale SQL queries, optimising queries, databases and applications for network, processing and memory constraints, developed back-end server code and front-end web applications.

Noteable Awards

2019	**Future Superstar Award** Science's highest performing PhD student.	University of Queensland
2016	**Bok Prize** Best astrophysics honours thesis in Australia.	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** Top physics graduate.	University of Queensland
2016	**University Medal (Science)**	University of Queensland
2015	**Australian Gemini Undergraduate Summer Studentships**	Australian Astronomical Observatory
2015	**AAO Honours Scholarship**	Australian Astronomical Observatory
2015	**University Medal (Engineering)**	University of Queensland

Other Awards

2015	**Rhodes Scholarship Finalist**	Oxford University
2015	**A.W. Oakes Scholarship**	St John's College
2015	**Harriet Marks Bursary** Academic merit in science honours.	University of Queensland
2015	**10x Deans Commendation**	University of Queensland

2015	**Helen Thompson Prize for All Round Excellence**	St John's College
2015	**IET Student Prize** Outstanding academic success.	The Institution of Engineering and Technology
2015	**David Andrew Krnak Memorial Prize** Top engineering graduate.	University of Queensland
2014	**UQ Future Leader**	University of Queensland
2014	**IEEE Student Thesis Prize** Best final year thesis.	IEEE
2014	**GroundProbe Prize** Best final year thesis.	University of Queensland
2014	**RWH Hawken Scholar**	University of Queensland
2014	**UQ Summer Research Scholarship**	University of Queensland
2012	**Walter Bruce Darker Scholarship**	University of Queensland
2012	**Exxon Mobil Achievement Award** Top mechanical engineering student.	University of Queensland
2011	**Alstom Prize** Top electrical engineering student.	University of Queensland
2010	**UQ Academic Excellence Scholarship**	University of Queensland
2010	**ICT Enabling Scholarship**	University of Queensland
2010	**John Black Prize**	University of Queensland

Communication

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

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

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

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

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

2018-2017 **Science Communicator** — Pint of Science, Physics in the Pub
Gave public talks to a general audience about various topics in astronomy.

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

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

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

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

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

2017 **Guest Scientist** — ScopeTV, Channel 10
Helped script, narrate and appear in a ScopeTV educational astronomy episode on the solar system.

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

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

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

Teaching

2018	**Introduction to Astrophysics Guest Lecturer**	University of Queensland
2018	**Cosmology Tutor and Guest Lecturer**	University of Queensland
2018	**Supervisor - Capstone Project**	University of Queensland
2017	**Computational Physics Tutor**	University of Queensland
2017	**Computational Physics Content Creator**	University of Queensland
2017	**Supervisor - Summer Project**	University of Queensland
2015	**5-Minute Physics Content Creator** Created simulations and visualisations.	University of Queensland

Academic Presentations

Feb 2019	**Hitting the Limits of Supernova cosmology**	ANITA
Nov 2017	**Coding Practises for the Busy Astronomer**	CAASTRO
Jun 2017	**Hierachical Bayesian Models for Supernova Cosmology**	Lawrence Berkeley National Lab
Dec 2016	**Introduction to git and code management**	University of Cambridge
Dec 2016	**Hierachical Bayesian Models for Supernova Cosmology**	University of Southampton
Dec 2016	**Hierachical Bayesian Models for Supernova Cosmology**	University of Portsmouth
Nov 2016	**Sound waves in Space: Wigglez and the BAO**	Swinburne University of Technology
Aug 2016	**Publishing Packages in Python**	University of Queensland
Aug 2016	**ChainConsumer: Plots and LaTeX from MCMC chains**	CAASTRO
May 2016	**Hieracrhical Bayesian Models for Supernova Cosmology**	Standford University
Feb 2016	**Detecting Globular Clusters in Maffei 1**	Gemini Institute
Nov 2015	**Marz - Redshifting software inside your browser**	OzDES Workshop

Publications

While still only in the third year of my PhD I have 3 first-author papers, and 14 contributing author papers. The software I wrote for presenting cosmological data is being used by the Dark Energy Survey (DES; a major international cosmology survey, of which I am a part) for all of their main results, including the Year 1 Results, (DES collaboration et al. 2018) which has 169 citations within one year of submission.

We are about to publish a series of 9 papers, the first supernova cosmology papers to emerge from DES, for which I am a primary author. These are available on arXiv and waiting on journal review.

First Author

Measuring the 2D baryon acoustic oscillation signal of galaxies in WiggleZ: cosmological constraints
Hinton, **S. R.** et al. MNRAS *464 (Feb. 2017) pp. 4807–4822*

ChainConsumer
Hinton, **S. R.** JOSS *1.4 (Aug. 2016). The Open Journal*

Marz: Manual and automatic redshifting software
Hinton, **S.R.** et al. Astronomy and Computing *15 (2016) pp. 61–71*

Contributing Author

Dark Energy Survey year 1 results: Cosmological constraints from galaxy clustering and weak lensing
Abbott, T. M. C. et al. Phys. Rev. D *98 (4 Aug. 2018) p. 043526. American Physical Society*

The Dark Energy Survey Data Release 1
Abbott, T. M. C. et al. ArXiv e-prints *(Jan. 2018)*

The WiggleZ Dark Energy Survey: final data release and the metallicity of UV-luminous galaxies
Drinkwater, M. J. et al. Monthly Notices of the Royal Astronomical Society *474 (Mar. 2018) pp. 4151–4168*

Dark Energy Survey year 1 results: Galaxy clustering for combined probes
Elvin-Poole, J. et al. Phys. Rev. D *98 (4 Aug. 2018) p. 042006. American Physical Society*

Dark Energy Survey Year 1 Results: Cross-Correlation Redshifts - Methods and Systematics Characterization
Gatti, M. et al. Monthly Notices of the Royal Astronomical Society *(Feb. 2018)*

Dark Energy Survey Year 1 Results: redshift distributions of the weak-lensing source galaxies
Hoyle, B et al. Monthly Notices of the Royal Astronomical Society *478.1 (2018) pp. 592–610*

Rapidly evolving transients in the Dark Energy Survey
Pursiainen, M et al. Monthly Notices of the Royal Astronomical Society *481.1 (2018) pp. 894–917*

OzDES multifibre spectroscopy for the Dark Energy Survey: 3-yr results and first data release
Childress, M. J. et al. Monthly Notices of the Royal Astronomical Society *472 (Nov. 2017) pp. 273–288*

The Taipan Galaxy Survey: Scientific Goals and Observing Strategy
da Cunha, E. et al. PASA *34, e047 (Oct. 2017) e047*

DES Science Portal: I - Computing Photometric Redshifts
Gschwend, J. et al. ArXiv e-prints *(Aug. 2017)*

Discovery of a z = 0.65 post-starburst BAL quasar in the DES supernova fields
Mudd, D. et al. Monthly Notices of the Royal Astronomical Society *468 (July 2017) pp. 3682–3688*

A Study of Quasar Selection in the Supernova Fields of the Dark Energy Survey
Tie, S. S. et al. AJ *153, 107 (Mar. 2017) p. 107*

The 2-degree Field Lensing Survey: design and clustering measurements
Blake, C. et al. Monthly Notices of the Royal Astronomical Society *462 (Nov. 2016) pp. 4240–4265*

OzDES multifibre spectroscopy for the Dark Energy Survey: first-year operation and results
Yuan, F. et al. Monthly Notices of the Royal Astronomical Society *452 (Sept. 2015) pp. 3047–3063*

In Advanced Preparation

First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Analysis, Systematic Uncertainties, and Validation
Brout, D. et al. ArXiv e-prints *(Nov. 2018)*

First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Photometric Pipeline and Light Curve Data Release
Brout, D. et al. ArXiv e-prints *(Nov. 2018)*

First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Survey Overview and Supernova Spectroscopy
D'Andrea, C. B. et al. arXiv e-prints *(Nov. 2018)*

Cosmological Constraints from Multiple Probes in the Dark Energy Survey
DES Collaboration et al. ArXiv e-prints *(Nov. 2018)*

First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: Constraints on Cosmological Parameters
DES Collaboration et al. ArXiv e-prints *(Nov. 2018)*

Steve: A hierarchical Bayesian model for Supernova Cosmology
Hinton, **S. R.** et al. ArXiv e-prints *(Nov. 2018)*

irst Cosmology Results using Type Ia Supernova from the Dark Energy Survey: Simulations to Correct Supernova Distance Biases
Kessler, R. et al. ArXiv e-prints *(Nov. 2018)*

First cosmology results using type Ia supernovae from the dark energy survey: Effects of chromatic corrections to supernova photometry on measurements of cosmological parameters
Lasker, J. et al. ArXiv e-prints *(Nov. 2018)*

First Cosmological Results using Type Ia Supernovae from the Dark Energy Survey: Measurement of the Hubble Constant
Macaulay, E. et al. ArXiv e-prints *(Nov. 2018)*

Quasar Accretion Disk Sizes from Continuum Reverberation Mapping in the DES Standard Star Fields

Yu, Z. et al. arXiv e-prints *(Nov. 2018)*