

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

- 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

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. Contenders' 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	Astrophysics Guest Lecturer	University of Queensland
2018	Cosmology Tutor and Guest Lecturer	University of Queensland
2018	Supervisor - Capstone Project	University of Queensland
2017	Computational Astrophysics Tutor	University of Queensland
2017	Computational Astrophysics 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

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	Hierachical 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*)

First 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*)