

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

- 2019 **SuperDataScience** Sunshine Coast, Queensland, Australia
Course Instructor
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.
- 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 **Lindau Nobel Laureate Delegate** Representing Australia at LINO19. Australian Academy of Science
- 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

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

2019-2017	ScopeTV Guest Scientist Helped script, narrate and appear in ScopeTV educational astronomy episodes.	ScopeTV, Channel 10
2019	Science Says! Scientific Panelist Panel scientist for Science Says, a comedy science show for Brisbane's World Science Festival.	World Science Festival
2019	Probably Science Podcast Guest Scientist Guest scientist for Probably Science, joining the previous guests of Neil deGrasse Tyson, Sean Carroll and more.	Probably Science Live Podcast and Comedy Show
2019	2SER Radio Scientific Correspondent Monthly scientific and astronomy updates.	Radio, 2SER
2018	BrisScience Presenter Invited to talk at the monthly BrisScience event on the dark side of the universe.	BrisScience & UQ
2018	Australian Survivor Invited Contestant, Academic Champion Cast as the academic champion for the 'Champions v. Contenders' season of Australian Survivor.	Endemol Shine
2018-2017	School Guest Presenter Talks to primary and secondary students on astronomy, science, STEM and career pathways.	Clayfield College, Gumdale State School
2019-2017	Science Communicator Gave public talks to a general audience about various topics in astronomy.	Pint of Science, Physics in the Pub
2017	Invited Presenter Invited presenter at a progression development program for physics PhD, honours and undergraduate students.	Research Education and Development Retreat
2017	Workshop Organiser, Host and Presenter Created and presented a code workshop focusing on open-source science run across Australia.	CAASTRO Code Workshop
2017	Battle of the Brains Panel Scientist Invited participant in a games panel discussion for physicists during National Science Week.	National Science Week
2017	World Science Festival Tour Guide Scientific tour guide for the Large Hadron Collider exhibit during the World Science Festival.	Queensland Museum & UQ

2017	FameLab Australia Scientist State finalist FameLab scientist. Public communication through radio interview and stage presentation.	British Council
2016	Guest Scientist, An Evening with Dr Lisa Randall Gave the opening speech for the Brisbane event, talking about the exciting future of astronomy.	ThinkInc
2016	UQ Science Demo Troupe Member Joined the UQ Science Demo troupe to create resources for the group and participate in UQ demonstrations.	University of Queensland
2016	Uluru Astronomer in Residence Accompanied Sky Tours to answer scientific questions from the public and gave public lectures on popular astronomy topics.	CAASTRO

Teaching

2019	Frontiers of Astrophysics Guest Lecturer	University of Queensland
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	University of Queensland

Academic Presentations

October 2019	Pippin: A pipeline for SN Ia cosmology	SCAM
July 2019	Barry - A BAO model fitting framework	Python in Astronomy
Mar 2019	The path towards Photometric Supernova Cosmology with DES	Cosmology on Safari
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	Hierarchical 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

Core Author

Can redshift errors bias measurements of the Hubble Constant?
Davis, Tamara M. et al. *MNRAS (Sept. 2019) p. 2279*

Steve: A Hierarchical Bayesian Model for Supernova Cosmology
Hinton, S. R. et al. *The Astrophysical Journal 876.1 (Apr. 2019) p. 15. American Astronomical Society*

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

Science Contributions

First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: Constraints on Cosmological Parameters

Abbott, T. M. C. et al. *ApJ* 872.2, L30 (Feb. 2019) p. L30

First Cosmology Results Using SNe Ia from the Dark Energy Survey: Analysis, Systematic Uncertainties, and Validation

Brout, D. et al. *ApJ* 874.2, 150 (Apr. 2019) p. 150

First Cosmology Results Using Type Ia Supernovae from the Dark Energy Survey: Photometric Pipeline and Light-curve Data Release

Brout, D. et al. *ApJ* 874.1, 106 (Mar. 2019) p. 106

First cosmology results using Type Ia supernova from the Dark Energy Survey: simulations to correct supernova distance biases

Kessler, R. et al. *MNRAS* 485.1 (May 2019) pp. 1171–1187

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. *MNRAS* 485.4 (June 2019) pp. 5329–5344

First cosmological results using Type Ia supernovae from the Dark Energy Survey: measurement of the Hubble constant

Macaulay, E. et al. *MNRAS* 486.2 (June 2019) pp. 2184–2196

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

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

Infrastructure / Data Contributions

Cosmological Constraints from Multiple Probes in the Dark Energy Survey

Abbott, T. M. C. et al. *Phys. Rev. Lett.* 122 (17 May 2019) p. 171301. *American Physical Society*

C IV black hole mass measurements with the Australian Dark Energy Survey (OzDES)

Hoormann, J. K. et al. *MNRAS* 487.3 (Aug. 2019) pp. 3650–3663

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. *ApJS* 239, 18 (Dec. 2018) p. 18

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)

DES science portal: Computing photometric redshifts

Gschwend, J. et al. *Astronomy and Computing* 25 (Oct. 2018) pp. 58–80

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

Quasar Accretion Disk Sizes from Continuum Reverberation Mapping from the Dark Energy Survey

- Mudd, D. et al. *ApJ* 862, 123 (Aug. 2018) p. 123
- 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
- The Taipan Galaxy Survey: Scientific Goals and Observing Strategy
da Cunha, E. et al. *PASA* 34, e047 (Oct. 2017) e047
- 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

In Journal Review

- 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)
- Quasar Accretion Disk Sizes from Continuum Reverberation Mapping in the DES Standard Star Fields
Yu, Z. et al. *arXiv e-prints* (Nov. 2018)