

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

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| 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

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| 2019-2017 | ScopeTV Guest Scientist | ScopeTV, Channel 10 |
| | Helped script, narrate and appear in ScopeTV educational astronomy episodes. | |
| 2019 | Science Says! Scientific Panelist | World Science Festival |
| | Panel scientist for Science Says, a comedy science show for Brisbane's World Science Festival. | |
| 2019 | Probably Science Podcast 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 | 2SER Radio 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 | Australian Survivor Invited Contestant, Academic Champion | 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. | |
| 2019-2017 | 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. | |

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| 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

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| 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

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| 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 | Hieracrhlcal 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

Primary Author

- 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

Contributing Author

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*

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

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

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

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

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

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 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)