

# Ed Macaulay

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## POSTDOCTORAL RESEARCH POSITIONS:

**CAASTRO Postdoctoral Research Fellow    University of Queensland    Since September 2014**

- Modelling the effects of gravitational lensing and peculiar velocities to constrain  $\sigma_8$  with supernovae in the Dark Energy Survey.
- Establishing a Bayesian framework for bulk flow and power spectrum measurements of the TAIPAN peculiar velocity survey.

**Fullford Junior Research Fellow    Somerville College, Oxford    September 2012 to September 2014**

- Forecast the performance of a cosmological survey with the WEAVE instrument.

**Postdoctoral Researcher    University of Sussex    May 2013 to September 2013**

- Marginalised over uncertainty in Planck  $\Lambda$ CDM parameters on fits to RSD data, and estimated the impact of the Alcock-Paczynski effect on RSD measurements in a Planck cosmology.

**Postdoctoral Researcher    University of Oxford    January 2012 to March 2013**

- Performed meta-analysis of systematic errors in RSD measurements.

## EDUCATION:

**Astrophysics DPhil.    University of Oxford    Graduated 2012**

- Measured the matter power spectrum from the COMPOSITE peculiar velocity catalogue.
- Forecast constraints on axions and neutrino properties with Euclid.
- Assisted with commissioning of the FMOS spectrograph on the Subaru telescope.
- *Thesis:* ‘Cosmology with Power Spectrum Measurements from Galaxy Surveys’  
<http://ora.ox.ac.uk/objects/uuid:bb918260-6747-4133-bdcb-b393d080c6fa>

**Physics MSci.    Imperial College, London    Graduated 2008**

- *Thesis:* ‘Probing the Early Universe With Luminous Quasars’  
[www.ed-macaulay.com/Macaulay\\_MSci\\_report.pdf](http://www.ed-macaulay.com/Macaulay_MSci_report.pdf)

## TEACHING & SUPERVISION:

**Summer Student Supervisor    University of Queensland    Since December 2015**

- Supervising two undergraduate student projects on data analysis with COSMOSIS and simulations of the TAIPAN Fundamental Plane survey.

**Guest Lecturer    University of Queensland    September to October 2015**

- Guest lecturer for honours cosmology course, covering topics such as curvature, inflation, the CMB and nucleosynthesis.

**Expert Examiner    University of Queensland    Since March 2015**

- Provided feedback on reports and conducted oral exams for Honours projects.

**Honours Project Supervisor    University of Queensland    Since January 2015**

- Supervised Honours student for project on the Tully-Fisher relation and cosmological bulk flows.

**Admissions Interviewer**      **Somerville College, Oxford**      **December 2013**

– Created physics-based questions and interviewed students for undergraduate admission.

**General Relativity**                      **Queen’s College, Oxford**                      **February to June 2012**  
**& Cosmology Tutor**

– Tutored third year physics undergraduates, and prepared revision tutorials and handouts.

**Computing Demonstrator**      **University of Oxford**                      **October 2009 to February 2010**

– Instructed and assessed first year physics undergraduate coding projects in C.

#### OTHER EXPERIENCE:

I have 2 nights’ experience remote observing on the AAT for the OzDES survey, and 12 nights’ experience observing with FMOS on the Subaru telescope. I have refereed papers for MNRAS. I have presented numerous outreach talks to visiting schools and at outreach events, and presented an invited talk at the Astronomical Association of Queensland.

#### PRESENTATIONS:

I have presented over 30 talks to date, including university seminars at the Australian National University, Berkeley, Caltech, Case Western Reserve, Durham, Harvard, Imperial, Ohio State, Oxford, Penn State, the Perimeter Institute for Theoretical Physics, Stanford, Swinburne, UCL, UC Riverside and invited talks at conferences in Brisbane, Haifa, and Oxford.

#### CONFERENCE POSTERS:

*‘Gravitational Signals from Noise in the Hubble Diagram’* Large Scale Structure Conference – Munich, Germany – July 2015 – [http://www.ed-macaulay.com/posters/Macaulay\\_LSS\\_poster.pdf](http://www.ed-macaulay.com/posters/Macaulay_LSS_poster.pdf)

*‘Measuring the Power Spectrum with Peculiar Velocities’* American Astronomical Society meeting – Austin, Texas – January 2012 – [http://www.ed-macaulay.com/posters/Macaulay\\_AAS\\_poster.pdf](http://www.ed-macaulay.com/posters/Macaulay_AAS_poster.pdf)

*‘Improving Dark Energy Figures of Merit in Future Galaxy Redshift Surveys’* National Astronomy Meeting – Llandudno, Wales – April 2011 – [http://www.ed-macaulay.com/posters/Macaulay\\_NAM\\_poster.pdf](http://www.ed-macaulay.com/posters/Macaulay_NAM_poster.pdf)

#### UNDERGRADUATE RESEARCH POSITIONS:

**Summer Undergraduate**      **Caltech**    **June to September 2007**  
**Research Fellowship**

– Developed new methods using infra-red spectroscopy to qualify parts for ultra-high vacuum.  
– Technical report: <https://dcc.ligo.org/T070242/public>  
– Caltech Undergraduate Research Journal article:  
[www.ed-macaulay.com/Macaulay\\_CURJ\\_article.pdf](http://www.ed-macaulay.com/Macaulay_CURJ_article.pdf)

**Undergraduate Research**      **Imperial College, London**      **August 2006**  
**Opportunities Placement**

– Tested ultra-violet light sources for space-based gravitational-wave missions.