Ed Macaulay

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Experience:

2019 to 2020: Assistant Professor of Physics & Astronomy
University of North Georgia, Department of Physics & Astronomy
– Lectured courses on classical mechanics, electromagnetism, special relativity, quantum physics, astronomy and data analysis.
– Supervised lab courses on algebra & calculus-based physics, and Solar System astronomy.
– Co-instructor of physics teaching pedagogy course.
– Leader of cosmology & relativity student study group.
– Published study of supernova lensing in the Dark Energy Survey.
– Awarded FUSE grant to supervise student project to develop spectroscopic reduction pipeline for UNG observatory (unable to accept).

2016 to 2019: Senior Postdoctoral Research Associate
University of Portsmouth, Institute of Cosmology & Gravitation
– Measured Hubble's Constant with cosmographic analysis of supernovae in Dark Energy Survey.
– Contributed to cosmological analysis of super-luminous supernovae.
– Guest lecturer on supernova cosmology.
– Member of departmental ATHENA-Swan committee.
– Supervised work-experience projects for high-school students.
– Contributed to successful departmental cosmology grant application.

2014 to 2016: CAASTRO Postdoctoral Research Fellow
University of Queensland, School of Mathematics & Physics
– Modelled & detected effects of gravitational lensing and peculiar velocities on supernovae.
– Developed blind cosmology analysis of supernovae in the Dark Energy Survey.
– Supervised undergraduate student projects on supernova peculiar velocities and gravitational lensing, and developing a virtual reality outreach app.
– Guest lecturer for honours cosmology course, covering topics such as curvature, inflation, the CMB and nucleosynthesis.
– Examiner for final year Honours reports and oral exams.
– Achieved permanent builder status with the Australian Dark Energy Survey.

2012 to 2014: Fulford Junior Research Fellow
University of Oxford, Somerville College & Department of Physics
– Measured first evidence of tension in large scale scale structure between Redshift Space Distortions and Planck CMB measurements.
– Forecast the performance of cosmological survey with the WEAVE instrument.
– Reviewed applications and interviewed students for undergraduate admission.
– Contributed forecasts to successful STFC cosmology grant application.

Education:

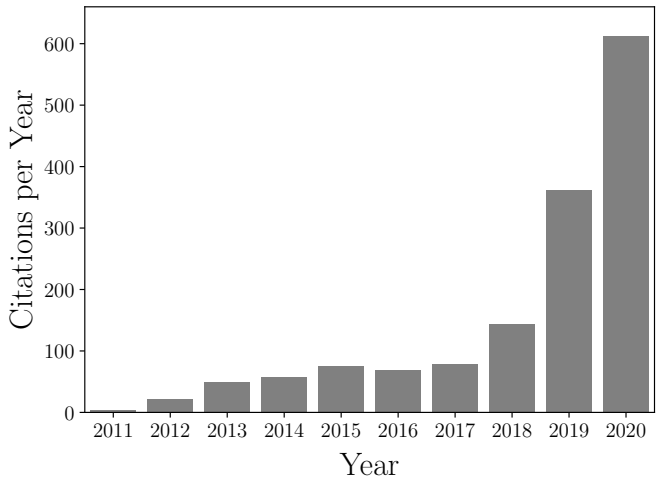
2008 to 2012: DPhil. in Astrophysics, University of Oxford

– Measured the dark matter power spectrum from peculiar velocity measurements.
– Forecast constraints on axions and neutrino properties with Euclid satellite.
– Assisted with commissioning of the FMOS spectrograph on the Subaru telescope.
– Tutored students for general relativity & cosmology course (Queen's College).
– Instructed and assessed first year physics undergraduate coding projects.
– *Thesis:* 'Cosmology with Power Spectrum Measurements from Galaxy Surveys'
`http://ora.ox.ac.uk/objects/uuid:bb918260-6747-4133-bdcb-b393d080c6fa`

2004 to 2008: MSci. in Physics, Imperial College, London

– Analysed detector qualification during summer research placement at LIGO, Caltech.
– Represented students on the faculty-student committee.
– *Thesis:* 'Probing the Early Universe With Luminous Quasars'
`www.ed-macaulay.com/Macaulay_MSci_report.pdf`

Research Output:



- h-index: 22
- i10-index: 35
- i100-index: 4
- Total citations: 1,552

Presentations:

I have presented many seminars and colloquia, at institutions including the AIP Potsdam, Australian National University, Berkeley, Caltech, Case Western Reserve, Durham, Georgia State, Harvard, Imperial, Melbourne, MPA Garching, MSSL, Nottingham, Ohio State, Oxford, Penn State, the Perimeter Institute for Theoretical Physics, Portsmouth, Southampton, Stanford, Swinburne, UCL, and UC Riverside.

Outreach:

My science outreach priority is engaging with audiences that are not typically engaged by science outreach, in locations such as cafes, pubs, cinemas, and music festivals. I have presented talks at events such as Astronomy on Tap, Cafe Scientifique, Stargazing Live and the Victorious and Blissfields Music festivals, and featured on BBC Radio Solent. I have also presented talks and engaged with outreach events at numerous local schools, university open days, and astronomical societies.

Teaching Feedback:

Samples of student feedback from courses taught at UNG:

'Dr. Macaulay wanted the entire class to succeed. He was willing to sit down with you and help you for however long it took to understand something. He is a great professor who cares very much for his students.'

'The lectures were intriguing and the instructor included real life applications of the material learned in class.'

'This is Dr. Macaulay's first time at UNG, and puts forth interesting concepts and ideas. He seems to care about his students, and he seems to want us to succeed. He makes assignments manageable and interesting. He had a good attitude and cares about the subject.'

'He tried to thoroughly explain the concepts during our time on tophat. He was always willing to help if we were confused.'

'It was a lab course, and he made the class fun and interesting'

'Dr. Macaulay was great one on one. If you asked him a questions during the lab, he was great at helping you reach a solution. He was also good at encouraging students to think critically.'

'He is very interested in the subject and excited to teach about it. He always tries his best to help and answer any questions you may have.'

'The instructor is very good teaching one on one, and they are very passionate about the subject.'

'He wants students to succeed.'

'He was always willing to help out if we had questions.'

'I think that Dr. Macaulay has good ideas and wants to try and relate physics to real life. The in class homeworks are helpful and the study guides for exams are also helpful.'

'There is no doubt that this professor is knowledgable in the material and well qualified, his use of work sheets and working out problems on the board.'

'This professor always asked if we had any questions and made sure that we understood the material before we moved on.'

'He was good at making us think more critically about a problem'

'The homework and study guides were super helpful.'

'Using practice tests were very helpful as well as the in class homework!'

'The assignments in the form of worksheets was very good practice.'

'He was very nice.'

'He uses many examples and shows all steps when working out problems.'

'He was good at explaining the materials.'

'activities were to the point and accurately portrayed the point of the lecture'

'The instructor made sure to help everyone who was in need, and made it a point to actually get to all of the students in a timely fashion.'

'He was accessible to students through email and during the lab.'

'He described the math very well. The top hat presentations and questions were the most useful thing that was presented in this course. He has the ability to explain the math and the reason behind the lab in an easy way that we can all understand. He was able to answer any questions that we had in lab.'

Outreach Feedback:

Samples of feedback from outreach events:

'Very interesting guest & topic!! He is very good in explaining the complex ideas'

'You presented the material in an understandable form that most all could grasp ... it was obviously appreciated and well received. Your presentation style showed you have great passion for your subject ... a most endearing quality indeed!'

'Fantastic. Very informative, well presented, interesting & easy to follow. More please!'

'This was a superb discussion. Ed's explanatory style is quite impressive'

List of Publications:

Macaulay, ... et al. *Weak Lensing of Type Ia Supernovae from the Dark Energy Survey*, MNRAS, (2020), http://arxiv.org/abs/2007.07956

Lidman, ... **Macaulay**, ... et al. *OzDES multi-object fibre spectroscopy for the Dark Energy Survey: Results and second data release*, MNRAS, (2020), http://arxiv.org/abs/2006.00449

de Jaeger, ... **Macaulay**, ... et al. *Studying Type II supernovae as cosmological standard candles using the Dark Energy Survey*, MNRAS, (2020), http://arxiv.org/abs/2005.09757

Inserra, ... **Macaulay**, ... et al. *First Hubble diagram and cosmological constraints using superluminous supernova*, MNRAS, (2020), http://arxiv.org/abs/2004.122218

Scolnic, ... **Macaulay**, ... et al. *Supernova Siblings: Assessing the Consistency of Properties of Type Ia Supernovae that Share the Same Parent Galaxies*, ApJL, (2020), http://arxiv.org/abs/2002.00974

Smith, ... **Macaulay**, ... et al. *First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: The Effect of Host Galaxy Properties on Supernova Luminosity*, MNRAS, (2020), http://arxiv.org/abs/2001.11294

Wiseman, ... **Macaulay**, ... et al. *Supernova Host Galaxies in the Dark Energy Survey: I. Deep Coadds, Photometry, and Stellar Masses*, MNRAS, (2020), http://arxiv.org/abs/2001.02640

Pursiainen, ... **Macaulay**, ... et al. *The Mystery of Photometric Twins DES17X1boj and DES16E2bjy*, MNRAS, (2020), http://arxiv.org/abs/1911.12083

Hoormann, ... **Macaulay**, ... et al. *CIV Black Hole Mass Measurements with the Australian Dark Energy Survey (OzDES)*, MNRAS, (2019), http://arxiv.org/abs/1902.04206

Angus, ... **Macaulay**, ... et al. *Superluminous Supernovae from the Dark Energy Survey*, MNRAS, (2018), http://arxiv.org/abs/1812.04071

D'Andrea, ... **Macaulay**, ... et al. *First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Survey Overview and Supernova Spectroscopy*, ApJ, (2018), http://arxiv.org/abs/1811.09565

Yu, ... **Macaulay**, ... et al. *Quasar Accretion Disk Sizes from Continuum Reverberation Mapping in the DES Standard Star Fields* , ApJ, (2018), http://arxiv.org/abs/1811.03638

Macaulay, ... et al. *First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: A Precision Measurement of the Hubble Constant*, MNRAS accepted, (2018), http://arxiv.org/abs/1811.02376

Hinton, ... **Macaulay**, ... et al. *Steve: A hierarchical Bayesian model for Supernova Cosmology*, ApJ submitted, (2018), http://arxiv.org/abs/1811.02381

Lasker, ... **Macaulay**, ... et al. *First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: Effects of Chromatic Corrections on Measurements of Cosmological Parameters*, MNRAS submitted, (2018), http://arxiv.org/abs/1811.02380

Kessler, ... **Macaulay**, ... et al. *First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: Simulations to Correct Supernova Distance Biases*, ApJ submitted, (2018), http://arxiv.org/abs/1811.02379

Brout, ... **Macaulay**, ... et al. *First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Photometric Pipeline and Light Curve Data Release*, ApJ submitted, (2018), http://arxiv.org/abs/1811.02378

Brout, ... **Macaulay**, ... et al. *First Cosmology Results Using Type Ia Supernovae From the Dark Energy Survey: Analysis, Systematic Uncertainties, and Validation*, ApJ submitted, (2018), http://arxiv.org/abs/1811.02377

Abbott, ... **Macaulay**, ... et al. *First Cosmology Results using Type Ia Supernovae from the Dark Energy Survey: Constraints on Dark Energy and Dark Matter Parameters*, PRL submitted, (2018), http://arxiv.org/abs/1811.02375

Abbott, ... **Macaulay**, ... et al. *Cosmological Constraints from Multiple Probes in the The Dark Energy Survey*, ApJ submitted, (2018), http://arxiv.org/abs/1811.02374

Pursiainen, ... **Macaulay**, ... et al. *Rapidly evolving transients in the Dark Energy Survey*, MNRAS , (2018), http://arxiv.org/abs/1803.04869

Mudd, ... **Macaulay**, ... et al. *Quasar Accretion Disk Sizes From Continuum Reverberation Mapping From the Dark Energy Survey*, ApJ (2017), http://arxiv.org/abs/1711.11588

Gatti, ... **Macaulay**, ... et al. *Dark Energy Survey Year 1 Results: Cross-Correlation Redshifts - Methods and Systematics Characterization*, MNRAS submitted, (2017), http://arxiv.org/abs/1709.00992

Gschwend, ... **Macaulay**, ... et al. *DES Science Portal: Computing Photometric Redshifts* , Astronomy& Computing Journal, (2017), http://arxiv.org/abs/1708.05643

Childress, ... **Macaulay**, ... et al. *OzDES multifibre spectroscopy for the Dark Energy Survey: Three year results and first data release*, MNRAS, (2017), http://arxiv.org/abs/1708.04526

Elvin-Poole, ... **Macaulay**, ... et al. *Dark Energy Survey Year 1 Results: Galaxy clustering for combined probes*, (2017), http://arxiv.org/abs/1708.01536

Hoyle, ... **Macaulay**, ... et al. *Dark Energy Survey Year 1 Results: Redshift distributions of the weak lensing source galaxies*, MNRAS submitted (2017), http://arxiv.org/abs/1708.01532

Tie, ... **Macaulay**, ... et al. *A Study of Quasar Selection in the Dark Energy Survey Supernova fields* , ApJ submitted (2017), http://arxiv.org/abs/1611.05456

Macaulay, Davis, Scovacricchi, Bacon, Collett, Nichol *'The effects of velocities and lensing on moments of the Hubble diagram '* MNRAS, (2017) http://arxiv.org/abs/1611.01315

Scovacricchi, Nichol, **Macaulay**, Bacon, *'Measuring weak lensing correlations of Type Ia Supernovae'* MNRAS, (2016) http://arxiv.org/abs/1607.03966

Mudd, ... **Macaulay**, ... et al. *Discovery of a z=0.65 Post-Starburst BAL Quasar in the DES Supernova Fields*, MNRAS submitted (2016), http://arxiv.org/abs/1606.02717

Akiyama, ... **Macaulay**, ... et al. *The Subaru-XMM-Newton Deep Survey (SXDS) VIII. Multi-wavelength identification, optical/NIR spectroscopic properties, and photometric redshifts of X-ray sources*, PASJ, (2015), http://arxiv.org/abs/1505.05487

Yabe, ... **Macaulay**, ... et al. *The mass-metallicity relation at z = 1.4 revealed with Subaru/FMOS*, MNRAS, (2014) http://arxiv.org/abs/1311.2624

Macaulay, Wehus, Eriksen, *'Lower Growth Rate from Recent Redshift Space Distortions than Expected from Planck'*, PRL, (2013) http://arxiv.org/abs/1303.6583

Nobuta, ... **Macaulay**, ... et al. *Black hole mass and Eddington ratio distribution functions of X-ray selected broad-line AGNs at z 1.4 in the Subaru XMM-Newton Deep Field'*, ApJ, (2012) http://arxiv.org/abs/1211.0069.

Roseboom, ... **Macaulay**, ... et al. *'FMOS near-IR spectroscopy of Herschel selected galaxies: star formation rates, metallicity and dust attenuation at z 1'*, MNRAS, (2012) http://arxiv.org/abs/1207.5564.

Macaulay, Feldman, Ferreira, Jaffe, Agarwal, Hudson, Watkins, *'Power Spectrum Estimation from Peculiar Velocity Catalogues'*, MNRAS, (2012) http://arxiv.org/abs/1111.3338

Yabe, ... **Macaulay**, ... et al. *'NIR Spectroscopy of Star-Forming Galaxies at z ∼1.4 with Subaru/FMOS: Mass-Metallicity Relation'*, PASJ, (2012) http://arxiv.org/abs/1112.3704

Marsh, **Macaulay**, Trebitsch, Ferreira, *'Ultra-light Axions: Degeneracies with Massive Neutrinos and Forecasts for Future Cosmological Observations'* PRD, (2012) http://arxiv.org/abs/1110.0502

Macaulay, Feldman, Ferreira, Hudson, Watkins, *'A Slight Excess of Large-Scale Power from Moments of the Peculiar Velocity Field'* MNRAS, (2011) http://arxiv.org/abs/1010.2651