

# Cullan HOWLETT:

## Curriculum Vitae and Publication List

### PERSONAL INFORMATION

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### PERSONAL STATEMENT

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I am a CAASTRO funded Post-doctoral researcher at the International Centre for Radio Astronomy Research. My main interests are combining models of large scale structure with galaxy redshift and peculiar velocity surveys to test gravity. My work lies on the interface between observation, theory and simulations and making use of modern numerical techniques to analyse data.

### EDUCATION

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- OCT 2015 - **CAASTRO funded PDRA**  
International Centre for Radio Astronomy Research,  
University of Western Australia, Perth, Australia.
- AUG 2012 - MAR 2016 **STFC funded PhD in Cosmology**  
Institute of Cosmology and Gravitation, Portsmouth, U.K.  
*Modelling and Measuring Cosmological Structure Growth*  
Submitted Sep 2015, Defended Jan 2016, Accepted Mar 2016.
- OCT 2008 - JUL 2012 **1<sup>st</sup> Class M.Phys. (Hons.) Physics with Astrophysics**  
University of Sussex, Brighton, U.K.

### OTHER RESEARCH EXPERIENCE

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Other than research undertaken during my PhD I have also carried out original research as part of my final year M. Phys. project and during four separate, 8-week research placements at the University of Sussex, held during my undergraduate degree.

- JUN 2012 - JUL 2012 **Research placement with Prof. Peter Thomas**  
Worked on modifications to the Hydra95 N-Body SPH code to model water dynamics and turbulent flows for industrial applications and flood predictions
- OCT 2012 - JUN 2012 **Final year M. Phys. project with Prof. Peter Thomas**  
Parallelising and optimizing the Hydra95 N-Body SPH code using MPI.
- JUL 2011 - AUG 2011 **Research placement with Dr. Antony Lewis**  
Using parameter degeneracies in the CMB to determine the numerical accuracy of CAMB and determining how different cosmological parameters affect the strength of these degeneracies
- JUL 2010 - AUG 2010 **Research placement with Dr. Jon Loveday**  
Analysis of data from the GAMA survey using multipoles of the correlation function.
- JUN 2009 - AUG 2009 **Research placement with Dr. Jon Loveday**  
Data reduction for the GAMA survey, and testing the accuracy of photometric redshift estimation using neural networks.

## TALKS, CONFERENCES AND SCHOOLS

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30th OCT - 4th Nov 2016	<b>Invited Speaker</b> , 7th KIAS Workshop on Cosmology and Structure Formation, Seoul, Korea.
3rd-9th JUL 2016	<b>Invited Speaker</b> , Large Scale Structure and Galaxy Flows, Quy Nhon, Vietnam.
23rd JAN 2015	<b>Invited Seminar Speaker</b> , University of Sussex, Brighton, U.K.
20th-24th OCT 2014	Dark Energy Survey Collaboration Meeting, Brighton, U.K.
23rd-26th JUN 2014	<b>Contributed Talk</b> at National Astronomy Meeting, Portsmouth, U.K.
1st-6th JUL 2013	‘New Horizons for Observational Cosmology’ International School of Physics Summer School, Varenna, Italy.
13th-15th MAY 2013	<b>Contributed Talk</b> at Euclid Collaboration Meeting, Leiden, Netherlands
10th-13th DEC 2012	BOSS/eBOSS Collaboration Meeting, Pittsburgh, U.S.A.

## AWARDS

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- 725,000 CPU hours for "*SONGS: Simulations of Non-standard Gravity for Surveys*" on Pawsey-Magnus (Jan 2017-Dec 2017). Equivalent value 21750 AUD.
- 250,000 CPU hours for "*SONGS: Simulations of Non-standard Gravity for Surveys*" on NCI-Raijin (Jan 2017-Dec 2017). Equivalent value 10000 AUD.
- 385,000 CPU hours for "*SONGS: Simulations of Non-standard Gravity for Surveys*" on NCI-Raijin (Jan 2017-Jun 2017). Equivalent value 15400 AUD.
- University of Sussex Physics Department Award for highest scoring physics graduate of 2012 (82%).
- 3 consecutive awards for highest achieving student in the 1st, 2nd and 3rd years of undergraduate degree (scores of 81%, 85% and 82% respectively).

## COMMITTEES

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- Member of The ICRAR UWA Diversity, Equality and Inclusivity committee (Jan 2017-).
- Member of the CAASTRO postdoctoral committee (Feb 2016-).
- Member of the TAIPAN survey executive committee (Aug 2016-Jan 2017).
- Co-chair of the cosmology working group for the TAIPAN survey (Aug 2016-).
- Postgraduate student representative for the ICG, (2014-2015).

## OTHER SKILLS AND TRAINING

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- Training in media presentation including interview, presenter and media editing skills (Oct 2014).
- Highly competent in computer programming, including working knowledge of Fortran90, C, IDL, Python and parallel programming via MPI.
- Knowledge of computer and supercomputer architecture.
- Experience working as part of a large collaboration, small group and individually.

## PUBLIC OUTREACH AND TEACHING

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- STEMNET ambassador for Institute of Cosmology and Gravitation: Involved in local outreach projects teaching schoolchildren aged 11-18.
- Successful proposal to produce online teaching resources under the GRADNET scheme (1000 GBP).
- Notable outreach contributions to BBC Stargazing Live at the Portsmouth Historic Dockyard (2013,2014) and ‘Bestival’ science tent (2013).

## REFERENCES

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PROF. WILL PERCIVAL  
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## PUBLICATION LIST

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12. **C. Howlett**, L. Staveley-Smith, C. Blake, *Cosmological Forecasts for Combined and Next Generation Peculiar Velocity Surveys*, 2016, MNRAS, in press.
11. P. Andersen, T. Davis, **C. Howlett**, *Cosmology with Peculiar Velocity Surveys: Observational Effects.*, 2016, MNRAS, in press.
10. A. Burden, W.J. Percival, **C. Howlett**, *Reconstruction in Fourier Space.*, 2015, MNRAS, 453, 456.
9. J. Liske, (+69 co-authors including **C. Howlett**), *Galaxy And Mass Assembly (GAMA): survey progress and data release 2*, 2015, MNRAS, 452, 2087.
8. **C. Howlett**, M. Manera, W.J.Percival, *PICOLA: A new code for generating large ensembles of mock galaxy catalogues.*, Astronomy & Computing, 12, 109.
7. **C. Howlett**, A. J. Ross, L. Samushia, W. J. Percival, M. Manera, *The Clustering of the SDSS Main Galaxy Sample II: Mock Galaxy Catalogues and a Measurement of the Growth of Structure from Redshift Space Distortions*, 2015, MNRAS, 449, 848
6. A. J. Ross, L. Samushia, **C. Howlett**, W. J. Percival, A. Burden, M. Manera, *The Clustering of the SDSS DR7 Main Galaxy Sample I: A 4 per cent Distance Measure at  $z=0.15$* , 2015, MNRAS, 449, 835.
5. M. Manera, L. Samushia, R. Tojeiro, **C. Howlett** (+7 co-authors), *The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: mock galaxy catalogues for the low-redshift sample*, 2015, MNRAS, 447, 437
4. E. Aubourg, (+93 co-authors including **C. Howlett**), *Cosmological implications of baryon acoustic oscillation (BAO) measurements*, 2014, arXiv:1411.1074
3. L. Anderson, (+64 co-authors including **C. Howlett**), *The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations in the Data Release 10 and 11 galaxy samples*, 2014, MNRAS, 441, 24.
2. R. Tojeiro, (+34 co-authors including **C. Howlett**), *The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: galaxy clustering measurements in the low-redshift sample of Data Release 11*, 2014, MNRAS, 440, 2222.
1. **C. Howlett**, A. Lewis, A. Hall, A. Challinor, *CMB power spectrum parameter degeneracies in the era of precision cosmology*, 2012, JCAP, 4, 27.