

# Luke J. M. Davies

ICRAR FELLOW (WAVES PROJECT SCIENTIST, DEVILS PRINCIPLE INVESTIGATOR)

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## Work History

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### University of Western Australia

Perth, Australia

ICRAR FELLOW

Oct 2016 - PRESENT

- Wide Area VISTA Extragalactic Survey (WAVES) Project Scientist
- 3yr appointment

### University of Western Australia

Perth, Australia

JOHN STOCKER FELLOW

Oct 2013 - Oct 2016

- Exploring star-formation and environment in GAMA
- 3yr appointment

### University of Bristol

Bristol, UK

POST-DOCTORAL RESEARCH ASSISTANT

Jun 2011 - Oct 2013

- Exploring the early evolution of galaxies
- 3yr appointment

### University of Portsmouth

Portsmouth, UK

EARLY STAGE RESEARCHER

Oct 2010 - Apr 2011

- Galaxy evolution in the dark energy survey
- 6 month fixed term contract

## Education

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### University of Bristol

Bristol, United Kingdom

PHD IN ASTROPHYSICS

Oct 2007 - May 2011

- Thesis topic: Multi-wavelength studies of early star-forming galaxies
- Supervisor: Prof. Malcolm Bremer

### University of Bristol

Bristol, United Kingdom

MSci IN PHYSICS WITH ASTROPHYSICS

Oct 2003 - Jul 2007

- 2nd class honours degree (2:1)

## Academic Experience

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### CURRENT POSITIONS HELD

- Deputy Project Scientist for the 4m Multi-Object Spectrograph Telescope (4MOST, [4most.eu](http://4most.eu))
- Principle Investigator for the Deep Extragalactic Visible Legacy Survey (DEVILS, [devilsurvey.org](http://devilsurvey.org))
- Project scientist for the Wide Area Vista Extragalactic Survey (WAVES, [wavesurvey.org](http://wavesurvey.org))
  
- Chair of the 4MOST Infrastructure Working Group - Extragalactic Pipeline
- Member of the 4MOST Operations Development Group
- Member of the 4MOST-Consortium science schedule development team
- Member of the 4MOST-Consortium survey strategy and cadence working groups
- Deputy Lead of the ASKAP-EMU Key Science Project: Cosmic star formation history (emu site)
- Member of the MSE-high-z/cosmology working group ([mse.cfht.hawaii.edu](http://mse.cfht.hawaii.edu))
- Lead author of MSE Science Reference Observation on IGM mapping
- Co-author of two other MSE Science Reference Observations
- Core member of the Galaxy And Mass Assembly survey ([gama-survey.org](http://gama-survey.org))
- Associate member of the SAMI galaxy survey ([sami-survey.org](http://sami-survey.org))
- Member of the CHILES survey ([chiles.astro.columbia.edu](http://chiles.astro.columbia.edu))
- Member of the HECTOR survey target selection working group
- Member of the ASKAP-DINGO survey team ([dingo-survey.org](http://dingo-survey.org))
- Member of the GLASS survey team (GLASS site)
- ICRAR-UWA PhD selection committee
- Multiple ICRAR/UWA interview panels

- Referee for a number of high impact journals (MNRAS, ApJ, A&A, AAS)
- Grant reviewer for the Australian Research Council (ARC)
- LOC & SOC chair of 'ICRARcon 2018' conference, ~120 attendees
- LOC & SOC chair of 'ICRARcon 2017' conference, ~100 attendees
- LOC & SOC chair of 'ICRARcon 2016' conference, ~100 attendees
- LOC & SOC chair of GAMA 2017 team meeting, ~60 attendees

## SELECTED GRANTS, AWARDS, OBSERVING TIME AND INVITED TALKS

Summary: ~100 P.I.-led observing nights, ~AU\$1.1 million in grant funding, 12 invited talks, Tall Poppy Award for outstanding young researchers

May 2019	<b>Invited Talk</b> , LSST@Asia - Exploring the Deep, Wide, Fast Universe	<i>Sydney, Australia</i>
Mar 2019	<b>SOC and Session Lead</b> , ASTRO3D Workshop: The life and death of star-forming galaxies	<i>Perth, Australia</i>
Feb 2019	<b>Invited Talk</b> , Joint Australia-ESO Conference: Linking galaxies from the epoch of initial star formation to today	<i>Sydney, Australia</i>
Oct 2018	<b>Award</b> , Young Tall Poppy Science Award for outstanding young researchers	<i>WA, Australia</i>
May 2018	<b>Invited Talk</b> , AAO workshop: Observational Techniques in Astronomy	<i>Sydney, Australia</i>
Apr 2018	<b>Invited Talk</b> , Mock Durham Conference	<i>Durham, UK</i>
Sep 2017	<b>Grant</b> , ARC Discovery Project - Dark-matter halos and galaxy evolution (AU\$390,877)	<i>Australia</i>
Dec 2017	<b>Invited Talk</b> , Hunstead Workshop on Galaxian Processes	<i>Sydney, Australia</i>
Sep 2017	<b>Grant</b> , Department of Industry, Innovation and Science - Galaxy Explorer Forensics (AU\$350,000)	<i>Australia</i>
Jun 2017	<b>Observing Time</b> , ATAC - DEVILS (90 nights, equivalent to ~AU\$1,500,000 in AAT operational costs)	<i>Australia</i>
Jun 2017	<b>Invited Talk</b> , Southern Cross Meeting 2017	<i>Sydney, Australia</i>
May 2017	<b>Invited Talk</b> , OzSKA 3 Meeting	<i>Sydney, Australia</i>
Feb 2017	<b>Invited Talk</b> , HECTOR Science Workshop	<i>Sydney, Australia</i>
Apr 2016	<b>Invited Talk</b> , eRosita Science Workshop	<i>Ringberg, Germany</i>
Jul 2015	<b>Invited Talk</b> , MSE Team Meeting	<i>Hawaii, U.S.A.</i>
Jun 2015	<b>Invited Talk</b> , Harley Wood Winter School	<i>Rottneest, Australia</i>
Apr 2015	<b>Invited Talk</b> , HECTOR Science Workshop	<i>Sydney, Australia</i>
Sep 2014	<b>Grant</b> , UWA Research Collaboration Award (AU\$5847)	<i>Perth, Australia</i>
Sep 2013	<b>Grant</b> , UWA Research Collaboration Award (AU\$5000)	<i>Perth, Australia</i>
Feb 2013	<b>Grant</b> , John Stocker Fellowship - 'Star-formation in the most typical environment' (AU\$360,000)	<i>Australia</i>
Mar 2013	<b>Observing Time</b> , Australia Telescope Compact Array TAC (6 nights)	<i>Australia</i>

## TEACHING

2016 -	<b>PhD selection panel</b> , ICRAR/UWA PhD scholarship applications	<i>UWA, Australia</i>
2015 -	<b>PhD student supervision</b> , 1 completed (S. Andrews), 3 current (S. Koushan, A. Hashemi, M. Bravo)	<i>UWA, Australia</i>
2014 -	<b>Masters level student supervision</b> , Numerous students	<i>UWA, Australia</i>
2011-13	<b>Level 1E physics course tutor</b> , Advanced pre-degree physics course	<i>UOB, UK</i>
2011-12	<b>Masters level lecture series</b> , The Properties of High Redshift Galaxies	<i>UOB, UK</i>
2007-10	<b>Laboratory Demonstrator</b> , Both physics and astronomy undergraduate courses	<i>UOB, UK</i>

## ONLINE ASTRONOMY TOOLS

- **TAzi**, Spectral analysis and classification tool ([tazi.icrar.org](http://tazi.icrar.org))
- **VISTA-view**, VISTA telescope image cutout server ([vistaview.icrar.org](http://vistaview.icrar.org))
- **AstroMap**, Survey sky layout plotting tool ([astromap.icrar.org](http://astromap.icrar.org))
- **SpecFit**, Spectral analysis and redshifting tool ([specfit.icrar.org](http://specfit.icrar.org))
- **SpecGen**, Spectral simulator tool ([specgen.icrar.org](http://specgen.icrar.org))
- **GAMA-PSI**, GAMA image cutout server ([cutout.icrar.org](http://cutout.icrar.org))

# Education & Outreach

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## PRESENTING

- Dec 2018 **TedX - Perth Guest Curator**, Designed the program and hosted event for TedX-Perth. Audience of 250 people. *Perth, Australia*
- Jul 2017 **Neil DeGrasse Tyson Event**, Hosted promotion company Think Inc's ([thinkinc.org.au](http://thinkinc.org.au)) evening with Dr Neil DeGrasse Tyson to an audience of ~2000 people ([See here](#)) *Perth, Australia*
- Aug 2017 **Perth Observatory's Winter Lecture**, Invited Talk for Perth Observatory titled 'Cosmic Fossil Hunting' *Perth, Australia*
- Aug 2016 **Brian Greene Event**, Presented at promotion company Think Inc's ([thinkinc.org.au](http://thinkinc.org.au)) evening with Prof Brian Greene to an audience of ~500 people. ([See here](#)) *Perth, Australia*
- Jan 2016 **Perth Observatory's Summer Lecture**, Invited Talk for Perth Observatory titled 'Amazing Cosmos' *Perth, Australia*
- Aug 2015 **Melbourne Astrofest**, Invited Talk at Melbourne Astrofest/Festival of Light titled 'Amazing Cosmos' *Melb, Australia*
- Nov 2014 **Techtrails - Women in Technology WA**, Spoke at Techtrails workshop organised by Women in Technology WA (WiTWA) *Perth, Australia*
- 2014 + **School, Societies and Events**, I present ~fortnightly at local high schools, astronomy clubs and public events promoting astronomy topics to a broad range of audiences from primary school children to active amateur astronomers and undergraduate STEM students. *Perth, Australia*
- 2014 + **Astro Morning Tea**, Organiser and presenter of ICRAR Astro Morning Tea - a weekly round-up of interesting science news aimed at promoting discussion of a broad range science topics. *Perth, Australia*

## CITIZEN SCIENCE

- Mar 2019 **AstroQuest**, Co-lead a department of Industry & Innovation AU\$350,000 funding for citizen science project to explore galaxies building on Galaxy Explorer. [astroquest.net.au](http://astroquest.net.au) *Perth, Australia*
- Aug 2015 **Galaxy Explorer**, Co-lead a citizen science project run by the ABC for national science week ([galaxyexplorer.net.au](http://galaxyexplorer.net.au)). *Perth, Australia*

## MEDIA

- Apr 2019 **Quest to Unlock the Secrets of our Universe**, Article interview in 'Australian Sky and Telescope' magazine describing AstroQuest. *Perth, Australia*
- Mar 2019 **AstroQuest Launch**, Various national and local radio interviews for the launch of AstroQuest. *Perth, Australia*
- Oct 2017 **Neutron-Star Mergers**, Co-produced a short video describing a neutron-star neutron-star merger for Australia's Science Channel which has received ~ 17, 000 views in the first two days ([Story link](#)). *Perth, Australia*
- 2017 + **Astro Morning Tea**, Write and co-present a series of online vod-casts giving a fortnightly round up of science news stories, which are published online by Australia's Science Channel (AMT). *Perth, Australia*
- Sep 2017 **TV Show Concept**, Currently involved in pitching a 10 episode series on Australian astronomy to a national Channel 7 broadcaster (to date secured investment of ~AU\$100,000 towards production of the series). *Perth, Australia*
- Oct 2016 **How Big is the Universe?**, Article published in 'All About Space' magazine's 'Space Mysteries' ([spaceanswers.com](http://spaceanswers.com)). *Perth, Australia*
- Jul 2015 **The Universe is Dying**, Made online video to support press release 'The Universe is Dying', which was viewed 60,000 times in one week, reposted on many sites including: CNN, NY Post and Huffington Post. Live TV interviews with the BBC and ABC ([See here](#)). *Perth, Australia*
- Jun 2015 **Cosmic Giant vs Galactic Dwarfs**, Press release story 'Cosmic Giant vs Galactic Dwarfs' published on multiple world-wide news sites and in print in the West Australian ([See here](#)). *Perth, Australia*
- Jun 2015 **Galactic Giants Stunt the Little Guy**, Article published in 'COSMOS' magazine ([Cosmos](#)). *Perth, Australia*
- Dec 2014 **ScienceSnippets - EM Spectrum**, Wrote and presented 'ScienceSnippets' educational video on the electromagnetic spectrum (EM Spectrum). *Perth, Australia*
- Mar 2014 **AstroFest 2014**, Presented public outreach video from 'Astrofest 2014', interviewing members of the public about astronomy and answering their astronomy-related questions. *Perth, Australia*
- Aug 2012 **Physics World Videos**, Presented short outreach videos for Physics World Magazine describing Dark Matter and Dark Energy in less than 90s to a general science audience (Dark Matter). *Bristol, UK*

# Publications

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## SUMMARY

- 76 refereed published papers, 13 (+1ATEL) first author, h-index=23, first author h-index=8, 1550 citations, 214 first author citations, manuscripts published by Monthly Notices of the Royal Astronomical Society (impact factor 5.107) and The Astrophysical Journal (impact factor 5.993). Current citation metrics (last 5 years): 65 publications with 1348 citations, 9 first author papers with 169 citations. All numbers correct as of 03/04/2019. [ADS link](#)

## FIRST AUTHOR PAPERS

**Galaxy And Mass Assembly (GAMA): Environmental Quenching of Centrals and Satellites in Groups** *MNRAS, 483, 5444*

DAVIES, L. J. M., ROBOTHAM, A. S. G., LAGOS, C. DEL P., ET AL. 2018

- Quenched fraction of centrals and satellites when controlled for stellar and halo mass
- Detailed parametrisation of satellite quenching

**Galaxy And Mass Assembly (GAMA): The sSFR-M<sub>\*</sub> Relation Part I -  $\sigma_{\text{sSFR}}$  as a function of sample, SFR indicator and environment** *MNRAS, 483, 1881*

DAVIES, L. J. M., LAGOS, C. DEL P., KATSIANIS, A., ET AL. 2018

- Exploration of the dispersion along the star-forming sequence
- Find U-shaped distribution consistent with models of feedback processes

**Deep Extragalactic Visible Legacy Survey (DEVILS): Motivation, Design and Target Catalogue** *MNRAS, 480, 786*

DAVIES, L. J. M., ROBOTHAM, A. S. G., DRIVER, S. P., ET AL. 2018

- DEVILS science motivation, survey design and target selection
- Overview of preliminary 2017B observations

**Classification of 3 DES supernova with OzDES and DEVILS** *ATEL #11717*

DAVIES, L. J. M., DRIVER, S. P., HASHEMIZADEH, A., ET AL. 2018

- Spectroscopic observations of three SNe within DEVILS

**Galaxy And Mass Assembly: the 1.4 GHz SFR indicator, SFR-M<sub>\*</sub> relation and predictions for ASKAP-GAMA** *MNRAS, 466, 2312*

DAVIES, L. J. M., HUYNH, M. T.; HOPKINS, A. M., ET AL. 2017

- Derivation of calibrators for 1.4 GHz SFRs and comparisons to existing SFR indicators in GAMA
- Predictions for the observability of GAMA-like sources with ASKAP

**GAMA/H-ATLAS: a meta-analysis of SFR indicators - comprehensive measures of the SFR-M<sup>\*</sup> relation and cosmic star formation history at z < 0.4** *MNRAS, 461, 458*

DAVIES, L. J. M., DRIVER, S. P., ROBOTHAM, A. S. G., ET AL. 2016

- Derivation of calibrators for multiple SFRs indicators in GAMA
- Evolution of cosmic star-formation

**Galaxy And Mass Assembly (GAMA): growing up in a bad neighbourhood - how do low-mass galaxies become passive?** *MNRAS, 455, 4013*

DAVIES, L. J. M., ROBOTHAM, A. S. G., DRIVER, S. P., ET AL. 2016

- Passive fractions of galaxies at low masses as a function of environment
- Simple model of interaction quenching in satellites

**Galaxy And Mass Assembly (GAMA): the effect of close interactions on star formation in galaxies** *MNRAS, 452, 616*

DAVIES, L. J. M., ROBOTHAM, A. S. G., DRIVER, S. P., ET AL. 2015

- The effect of interactions on galaxies as a function of stellar mass and pair-mass ratio
- Star-formation in interactions compared to SFR indicator timescales

**Galaxy And Mass Assembly (GAMA): curation and reanalysis of 16.6k redshifts in the G10/COSMOS region**

*MNRAS*, 447, 1014

DAVIES, L. J. M., DRIVER, S. P., ROBOTHAM, A. S. G., ET AL.

2015

- Re-analysis of spectroscopic sample in COSMOS region
- Defined sample for numerous future papers

**Identifying clustering at high redshift through actively star-forming galaxies**

*MNRAS*, 438, 2732

DAVIES, L. J. M., BREMER, M. N., STANWAY, E. R., ET AL.

2014

- Using clustering of photometrically star-forming galaxies to identify clustering at high redshift.
- Produced sample of potential high redshift proto-clusters

**Detecting massive galaxies at high redshift using the Dark Energy Survey**

*MNRAS*, 434, 296

DAVIES, L. J. M., MARASTON, C., THOMAS, D., ET AL.

2013

- Using colour selections to predict the possible identification of massive high redshift galaxies in DES

**The detection of FIR emission from high-redshift star-forming galaxies in the ECDF-S**

*MNRAS*, 433, 2588

DAVIES, L. J. M., BREMER, M. N., STANWAY, E. R., ET AL.

2013

- Using colour selection and stacking to explore FIR emission from high-z galaxies
- First robust detections of FIR emission from 'typical' galaxies at this epoch

**Limits on dust emission from  $z \sim 5$  LBGs and their local environments**

*MNRAS*, 425, 153

DAVIES, L. J. M., BREMER, M. N., STANWAY, E. R., ET AL.

2012

- Using colour selection and stacking to explore FIR emission from over-densities of galaxies at  $z \sim 5$

**Limits on the molecular gas content of  $z \sim 5$  LBGs**

*MNRAS*, L122

DAVIES, L. J. M., BREMER, M. N., STANWAY, E. R., ET AL.

2010

- Using colour selection and stacking to explore molecular gas emission from over-densities of galaxies at  $z \sim 5$