

Dougal Dobie

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I am a PhD student at the University of Sydney working in radio astronomy, with a focus in radio transients, gravitational waves and high-energy astrophysics. I'm also interested in multi-wavelength transients science, data science and machine learning.

Education

Doctor of Philosophy (Science)

Thesis title: Radio follow-up of gravitational wave events

University of Sydney

2017–present

Bachelor of Science (Advanced) (Hons.)

Physics (major), Applied Mathematics and Computational Science

University of Sydney

2013–2016

Refereed Publications

I am first author of 2 papers published in the *Publications of the Astronomical Society of Australia* and *Astrophysical Journal Letters*, one of which was awarded the University of Sydney Faculty of Science Postgraduate Research Prize for Outstanding Academic Achievement.

I am also a co-author of 10 other papers published in a range of journals including *Nature* and *Science*. My h-index is 10, with over 1900 total citations (>60 citations for first author papers). A chronological list of my publications is attached at the end of this document.

Professional Activities

Australia Telescope User Committee Representative

Liaise between the telescope user community and ATNF Director

Australia Telescope National Facility

2018/2019

Duty Astronomer

Assist observers using the Australia Telescope Compact Array

Australia Telescope National Facility

2017–present

Local Organising Committee

Local logistics for Science At Low Frequencies IV

University of Sydney

December 12–17, 2017

Invited Talks

Exploring the Universe with Gravity & Light

The 5th Chinese SKA Summer School 2019

Shanghai Astronomical Observatory

August 2019

Detection of Radio Emission from a Gravitational Wave Event

Stars in Sydney 2017

Macquarie University

November 2017

Successful Telescope Proposals

I am the PI of the ongoing ATCA proposal *Radio follow-up of LIGO gravitational wave events* (750 hrs). I am also the PI or co-PI on multiple other standard and target-of-opportunity ATCA proposals, totalling several hundred hours of observing time. I regularly successfully request target-of-opportunity observing with the ATCA to follow-up interesting transient sources. I have extensive experience carrying out ATCA observations and data reduction.

I am also a co-PI of several proposals on the MWA (3 hrs), ASKAP (100 hrs) and the VLA (280 hrs). I have experience with data reduction and analysis of observations from all three of these telescopes.

Teaching Experience

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| Undergraduate Tutor <i>Lab tutor (Second Year Physics), Night Viewing guide (First Year Astronomy)</i> | University of Sydney 2016–present |
| Teaching Assistant <i>OLET1618 – Data Driven Astronomy: Algorithms</i> | University of Sydney 2018–present |
| Online Tutor <i>Coursera – Data Driven Astronomy</i> | Coursera 2018–present |
| Lecturer <i>The 5th Chinese SKA Summer School 2019</i> | Shanghai Astronomical Observatory August 2019 |
| Undergraduate Research Advisor <i>Pablo Bonilla Ataides - “Prospects for radio follow-up of BNS mergers”</i> | University of Sydney 2019 |
| Workshop development <i>Undergraduate workshop on radio data analysis</i> | GROWTH Astronomy School December 2018, August 2019 |
| Course Development <i>Material for Data Driven Astronomy online course</i> | University of Sydney 2016/17 |

Awards and Commendations

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| <i>Faculty of Science Postgraduate Research Prize for Outstanding Academic Achievement</i> | 2019 |
| <i>University of Sydney Postgraduate Research Support Scheme</i> | 2019 |
| <i>University of Sydney Merit Award</i> | 2017-2020 |
| <i>Research Training Program (RTP) Stipend Scholarship</i> | 2017-2020 |
| <i>University of Sydney School of Physics Summer Research Scholarship</i> | 2013/14, 2014/15 |
| <i>University of Sydney Mathematics Entry Scholarship</i> | 2013 |

Selected Public Outreach

I believe a key responsibility of all scientists is communicating their results to the general public. I regularly volunteer at public outreach events and have three years of experience communicating science to the public at Sydney Observatory. I have also given interviews to the Australian media about my research. Below are some examples of my experience with science communication

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| Astronomy Educator <i>Educating school groups and the general public</i> | Sydney Observatory 2016–present |
| Workshop Facilitator & Science Advisor <i>Promoting female innovation and entrepreneurship in STEM</i> | Galaxy Convention 5 December 2017 |
| Science in a Lunchtime <i>Q&A: Exploring the Hidden Universe & Careers in Astronomy</i> | Mosman High School 17 November 2017 |
| CAASTRO Astronomer in Residence <i>Educating the general public & promoting Australian astronomy</i> | Ayers Rock Resort August 2017 |
| Sydney Astrofest <i>Interacting with the public and general logistics</i> | University of Sydney 2016, 2017 |

Publications

David Kaplan, Shi Dai, Emil Lenc, et al. (incl. **Dobie** and 9 others). Serendipitous Discovery of PSR J1431-6328 as a Highly-Polarized Point Source with the Australian SKA Pathfinder. *arXiv e-prints*, art. arXiv:1908.03163, Aug 2019.

Filip W. Chatys, Timothy R. Bedding, Simon J. Murphy, et al. (incl. **Dobie** and 2 others). The period-luminosity relation of red supergiants with Gaia DR2. *MNRAS*, page 1518, Jun 2019. doi: 10.1093/mnras/stz1584.

D. Dobie, T. Murphy, D. L. Kaplan, et al. An optimised gravitational wave follow-up strategy with the Australian Square Kilometre Array Pathfinder. *PASA*, 36:e019, Jan 2019. doi: 10.1017/pasa.2019.9.

Anna Y. Q. Ho, E. Sterl Phinney, Vikram Ravi, et al. (incl. **Dobie** and 13 others). AT2018cow: A Luminous Millimeter Transient. *ApJ*, 871(1):73, Jan 2019. doi: 10.3847/1538-4357/aaf473.

K. P. Mooley, D. A. Frail, **D. Dobie**, et al. A Strong Jet Signature in the Late-time Light Curve of GW170817. *ApJ*, 868(1):L11, Nov 2018a. doi: 10.3847/2041-8213/aaeda7.

Dougal Dobie, David L. Kaplan, Tara Murphy, et al. A Turnover in the Radio Light Curve of GW170817. *ApJ*, 858(2):L15, May 2018. doi: 10.3847/2041-8213/aac105.

K. P. Mooley, E. Nakar, K. Hotokezaka, et al. (incl. **Dobie** and 21 others). A mildly relativistic wide-angle outflow in the neutron-star merger event GW170817. *Nature*, 554(7691):207–210, Feb 2018b. doi: 10.1038/nature25452.

G. Hallinan, A. Corsi, K. P. Mooley, et al. (incl. **Dobie** and 29 others) A radio counterpart to a neutron star merger. *Science*, 358(6370):1579–1583, Dec 2017. doi: 10.1126/science.aap9855.

M. M. Kasliwal, E. Nakar, L. P. Singer, et al. (incl. **Dobie** and 76 others) Illuminating gravitational waves: A concordant picture of photons from a neutron star merger. *Science*, 358(6370):1559–1565, Dec 2017. doi: 10.1126/science.aap9455.

I. Andreoni, K. Ackley, J. Cooke, et al. (incl. **Dobie** and 120 others) Follow Up of GW170817 and Its Electromagnetic Counterpart by Australian-Led Observing Programmes. *PASA*, 34:e069, Dec 2017. doi: 10.1017/pasa.2017.65.

B. P. Abbott, R. Abbott, T. D. Abbott, et al. (incl. **Dobie** and 3673 others) Multi-messenger Observations of a Binary Neutron Star Merger. *ApJ*, 848(2):L12, Oct 2017. doi: 10.3847/2041-8213/aa91c9.

Tara Murphy, David L. Kaplan, Martin E. Bell, et al. (incl. **Dobie** and 23 others) Low-Frequency Spectral Energy Distributions of Radio Pulsars Detected with the Murchison Widefield Array. *PASA*, 34:e020, Apr 2017. doi: 10.1017/pasa.2017.13.

M. E. Bell, Tara Murphy, S. Johnston, et al. (incl. **Dobie** and 34 others) Time-domain and spectral properties of pulsars at 154 MHz. *MNRAS*, 461(1):908–921, Sep 2016. doi: 10.1093/mnras/stw1293.