

# 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. I hold Australian citizenship.

## 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 4 papers, 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 12 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-I 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-I 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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<b>Undergraduate Tutor</b> <i>Lab tutor (Second Year Physics), Night Viewing guide (First Year Astronomy)</i>	<b>University of Sydney</b> 2016–present
<b>Teaching Assistant</b> <i>OLET1618 – Data Driven Astronomy: Algorithms</i>	<b>University of Sydney</b> 2018–present
<b>Online Tutor</b> <i>Coursera – Data Driven Astronomy</i>	<b>Coursera</b> 2018–present
<b>Lecturer</b> <i>The 5th Chinese SKA Summer School 2019</i>	<b>Shanghai Astronomical Observatory</b> August 2019
<b>Undergraduate Research Advisor</b> <i>Pablo Bonilla Ataides - “Prospects for radio follow-up of BNS mergers”</i>	<b>University of Sydney</b> 2019
<b>Workshop development</b> <i>Undergraduate workshop on radio data analysis</i>	<b>GROWTH Astronomy School</b> December 2018, August 2019
<b>Course Development</b> <i>Material for Data Driven Astronomy online course</i>	<b>University of Sydney</b> 2016/17

## Awards and Commendations

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<i>Australian Institute of Physics (NSW Branch) Award for Postgraduate Excellence in Physics</i>	2019
<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

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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

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

## Publications

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A. Krone-Martins, M. J. Graham, D. Stern, et al. (incl. **Dobie** and 21 others). Gaia GrL: Gaia DR2 Gravitational Lens Systems. V. Doubly-imaged QSOs discovered from entropy and wavelets. *arXiv:1912.08977*, Dec 2019.

**Dougal Dobie**, David L. Kaplan, Kenta Hotokezaka, et al. Constraining properties of neutron star merger outflows with radio observations. *MNRAS* (submitted), *arXiv:1910.13662*, Oct 2019b.

**Dougal Dobie**, Adam Stewart, Tara Murphy, et al.. An ASKAP search for a radio counterpart to the first high-significance neutron star-black hole merger LIGO/Virgo S190814bv. *ApJ*, 887(1):L13, Dec 2019c. doi: 10.3847/2041-8213/ab59db.

Igor Andreoni and Daniel A. Goldstein, et al. (incl. **Dobie** and 49 others) GROWTH on S190814bv: Deep Synoptic Limits on the Optical/Near-Infrared Counterpart to a Neutron Star-Black Hole Merger. *ApJ*, *arXiv:1910.13409*, Oct 2019.

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. *ApJ*, 884(1):96, Oct 2019. doi: 10.3847/1538-4357/ab397f.

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.