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) — **University of Sydney**
Thesis title: Radio follow-up of gravitational wave events — *2017–present*

Bachelor of Science (Advanced) (Hons.) — **University of Sydney**
Physics (major), Applied Mathematics and Computational Science — *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 1600 total citations (57 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 — **Australia Telescope National Facility**
Liase between the telescope user community and ATNF Director — *2018/2019*

Duty Astronomer — **Australia Telescope National Facility**
Assist observers using the Australia Telescope Compact Array — *2017-present*

Local Organising Committee — **University of Sydney**
Local logistics for Science At Low Frequencies IV — *December 12-17, 2017*

Member
The Astronomical Society of Australia — *2016-present*

Succesful 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

Undergraduate Tutor — **University of Sydney**
Lab tutor (Second Year Physics), Night Viewing guide (First Year Astronomy) — *2016–present*

Teaching Assistant — **University of Sydney**
OLET1618 – Data Driven Astronomy: Algorithms — *2018–present*

Online Tutor — **Coursera**
Coursera – Data Driven Astronomy — *2018–present*

Lecturer — **Shanghai Astronomical Observatory**
The 5th Chinese SKA Summer School 2019 — *August 2019*

Undergraduate Research Advisor — **University of Sydney**
Pablo Bonilla Ataides - "Prospects for radio follow-up of BNS mergers" — *2019*

Workshop development — **GROWTH Astronomy School**
Undegraduate workshop on radio data analysis — *December 2018, August 2019*

Course Development — **University of Sydney**
Material for Data Driven Astronomy online course — *2016/17*

High School Mathematics Tutor
Individual tuition for students with a range of abilities from a range of backgrounds — *2012–2017*

Awards and Commendations

Faculty of Science Postgraduate Research Prize for Outstanding Academic Achievement — *2019*

University of Sydney Postgraduate Research Support Scheme — *2019*

University of Sydney Merit Award — *2017-2020*

Research Training Program (RTP) Stipend Scholarship — *2017-2020*

University of Sydney School of Physics Summer Research Scholarship — *2013/14, 2014/15*

University of Sydney Mathematics Entry Scholarship — *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

Astronomy Educator — **Sydney Observatory**
Educating school groups and the general public — *2016–present*

Workshop Facilitator & Science Advisor — **Galaxy Convention**
Promoting female innovation and entreupenership in STEM — *5 December 2017*

Science in a Lunchtime — **Mosman High School**
Q&A: Exploring the Hidden Universe & Careers in Astronomy — *17 November 2017*

CAASTRO Astronomer in Residence — **Ayers Rock Resort**
Educating the general public & promoting Australian astronomy — *August 2017*

Sydney Astrofest — **University of Sydney**
Interacting with the public and general logistics — *2016, 2017*

Refereed Publications

Filip W. Chatys, Timothy R. Bedding, Simon J. Murphy, László L. Kiss, Dougal Dobie, and Jonathan E. Grindlay. 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, S. Ghosh, K. W. Bannister, and R. W. Hunstead. 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, S. R. Kulkarni, Glen Petitpas, Bjorn Emonts, V. Bhalerao, Ray Blundell, S. Bradley Cenko, Dougal Dobie, et al. 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, E. Lenc, A. Corsi, K. De, A. J. Nayana, S. Makhathini, I. Heywood, T. Murphy, 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, Emil Lenc, Kunal P. Mooley, Christene Lynch, Alessandra Corsi, Dale Frail, Mansi Kasliwal, and Gregg Hallinan. 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, G. Hallinan, A. Corsi, D. A. Frail, A. Horesh, T. Murphy, E. Lenc, D. L. Kaplan, et al. 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, K. Hotokezaka, E. Nakar, M. M. Kasliwal, D. L. Kaplan, D. A. Frail, S. T. Myers, T. Murphy, et al. 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, D. L. Kaplan, D. O. Cook, A. Van Sistine, R. M. Lau, C. Fremling, O. Gottlieb, J. E. Jencson, et al. 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, A. Acharyya, J. R. Allison, G. E. Anderson, M. C. B. Ashley, D. Baade, M. Bailes, K. Bannister, et al. 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, F. Acernese, K. Ackley, C. Adams, T. Adams, P. Addesso, R. X. Adhikari, V. B. Adya, et al. 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, J. R. Callingham, Steve Croft, Simon Johnston, Dougal Dobie, Andrew Zic, Jake Hughes, Christene Lynch, et al. 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, D. L. Kaplan, S. Croft, P. Hancock, J. R. Callingham, A. Zic, D. Dobie, J. K. Swiggum, et al. Time-domain and spectral properties of pulsars at 154 MHz. *MNRAS*, 461 (1):908–921, Sep 2016. doi: 10.1093/mnras/stw1293