



# Research Fellow in Gravitational Wave Astrophysics

|                                  |                                 |
|----------------------------------|---------------------------------|
| Department/Unit                  | School of Physics and Astronomy |
| Faculty/Division                 | Faculty of Science              |
| Classification                   | Level A                         |
| Work location                    | Clayton                         |
| Date document created or updated | 17 November 2017                |

## Organisational context

Everyone needs a platform to launch a satisfying career. At Monash, we give you the space and support to take your career in all kinds of exciting new directions. You'll have access to quality research, infrastructure and learning facilities, opportunities to collaborate internationally, as well as the grants you'll need to publish your work. We're a university full of energetic and enthusiastic minds, driven to challenge what's expected, expand what we know, and learn from other inspiring, empowering thinkers. Discover more at [www.monash.edu](http://www.monash.edu)

**The Faculty of Science** works at the frontiers of research, which informs our multifarious teaching programs. Partnerships with industry, government and individual supporters augments both our research and teaching programs. Our five schools offer a large and diverse range of disciplines in undergraduate and postgraduate courses. Ten schools from other University faculties contribute to science teaching at all levels, allowing students to choose their studies from physical, biological, biomedical, behavioural, environmental, mathematical and computer sciences. In terms of research, our respected researchers are leaders in their fields. Their work spans the theoretical to the applied, contributes to new knowledge and technologies, and challenges how we interact with the world. To learn more about the Faculty of Science, please visit our website: [www.monash.edu/science/](http://www.monash.edu/science/)

**The School of Physics and Astronomy** is a new School located within the Faculty of Science. It was formed in 2015 as a result of merging the former School of Physics with astrophysicists from the School of Mathematical Sciences. The School aims to position itself as one of the top physics and astronomy research and teaching departments in Australia. In the past five years the School has gone through an exciting period of renewal – investing significantly in people and facilities. The School of Physics and Astronomy is committed to teaching and research of the highest quality in astronomy, astrophysics, experimental physics, and theoretical physics; it aims to produce graduates with a strong foundation in physics and astrophysics. We are recognised internationally for research in a number of fields of physics and astrophysics; however, we are focused on significantly strengthening our research base to achieve the status of a top ranked international department.

In the 2015 national audit of research excellence (ERA), the School achieved the maximum overall rating of 5 for Physical Sciences, including the maximum rating of 5 in each of our assessed fields of research (spanning astronomy and astrophysics, atomic and molecular physics, nuclear physics, particle physics, condensed matter physics and optics).

The School has research strengths in astronomy and astrophysics, ultracold atomic gases, X-ray optics and biomedical imaging, gravitational wave physics, electron microscopy and diffraction, condensed matter physics and high energy particle physics. Currently the School is actively involved in six research centres:

- The Monash Centre for Astrophysics (MoCA - <http://moca.monash.edu>);
- The ARC Centre of Excellence for Gravitational Wave Discovery;
- The ARC Centre of Excellence for Particle Physics at the Terascale (CoEPP) <http://www.coepp.org.au/>;
- The ARC Centre of Excellence for Future Low Energy Electronics Technologies;

- The Monash Centre for Electron Microscopy (MCEM - <http://mcem.monash.edu.au>);
- The Monash Centre for Atomically Thin Materials MCATM (<https://www.monash.edu/atomically-thin-materials>).

In addition, the School has over a dozen Australian Research Council funded programmes and is an active user of the Australian Synchrotron and the Melbourne Centre for Nanofabrication, which are located adjacent to the Clayton Campus of Monash University.

The School hosts the Monash Centre for Astrophysics, which is one of the most diverse astrophysics research groups in Australia. The School conducts research in gravitational-wave astronomy as part of the LIGO Scientific Collaboration and the Parkes and International Pulsar Timing Array Collaborations, both of which fall under the newly-formed ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) which began in 2017. Other major areas of research in the School include: active galaxies, astrophysical fluid dynamics and magnetohydrodynamics, galaxy evolution, first stars, the formation of stars, stellar evolution, stellar nucleosynthesis, nuclear astrophysics, chemical evolution, galactic archaeology, supernovae, supernova remnants, neutron stars, stellar transients, supermassive black holes, high energy astrophysics, gravitational wave astronomy, stellar and planetary dynamics, and exoplanets. The Australian astrophysics community is heavily involved in major observational and computational facilities, including the Advanced Laser Interferometer Gravitational-wave Observatory (aLIGO), the Australian Square Kilometre Array Pathfinder (ASKAP), the Giant Magellan Telescope, the Australian Astronomical Observatory, Skymapper, HERMES, NCI, and the Green II and gSTAR supercomputers. In addition the School conducts research into particle physics and cosmology through the ARC Centre of Excellence for Particle Physics at the Terascale (CoEPP). It is also member of the Joint Institute for Nuclear Astrophysics and has close collaborations with the Center for Nuclear Astrophysics at Shanghai Jiao Tong University.

Further information about the position and the School of Physics and Astronomy is available at: <http://www.physics.monash.edu.au/>

**OzGrav** is a \$40M Centre of Excellence funded by the Australian Research Council that started in 2017. The mission is to capitalize on the historic first detections of gravitational waves to understand the extreme physics of black holes and warped spacetime, to inspire the next generation of Australian scientists and engineers through this new window on the Universe. The Centre brings together leading researchers from five Australian universities working on three themes: astrophysics, data, and instrumentation.

## Position purpose

The Level A academic is expected to carry out research in gravitational-wave astronomy, in particular astrophysics and modelling of LIGO gravitational-wave sources and analysing LIGO data.

**Reporting line:** The position reports to Dr. Paul Lasky

**Supervisory responsibilities:** Not applicable

**Financial delegation and/or budget responsibilities:** Not applicable

## Key responsibilities

Specific duties required of a Level A research-only academic may include:

1. The conduct of research under limited supervision either as a member of a team or, where appropriate, independently and the production or contribution to the production of conference and seminar papers and publications from that research
2. Involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise
3. Limited administrative functions primarily connected with the area of research of the academic;
4. Development of a limited amount of research-related material for teaching or other purposes with appropriate guidance from other staff
5. Occasional contributions to teaching in relation to her/his research project(s)
6. Experimental design and operation of advanced laboratory and technical equipment or conduct of advanced research procedures
7. Attendance at meetings associated with research or the work of the organisational unit to which the research is connected and/or at departmental, school and/or faculty meetings and/or membership of a limited number of committees

8. Advice within the field of the staff member's research to postgraduate students

## **Key selection criteria**

### **Education/Qualifications**

1. The incumbent should possess:
  - a PhD in astrophysics, physics, or a related discipline from a recognised university or equivalent qualifications and research experience in the area
  - an equivalent combination of relevant experience and/or education/training

### **Knowledge and Skills**

2. Research achievements in astrophysics and/or physics, including a strong record of scientific creativity, publications and citations in the highest impact astrophysics and/or physics journals
3. The ability to work independently in a research environment (with limited supervision)
4. The ability to prepare and communicate the aims and outputs of research projects in a range of formats including formal and informal oral presentations, refereed research papers and reports
5. Demonstrated well-developed computer literacy and proficiency in the production of high level work using languages and domain-specific software, with the capability and willingness to learn new packages as appropriate
6. Excellent planning and organisational skills, including the ability to prioritise multiple tasks and meet deadlines
7. Experience in gravitational-wave astronomy (or closely related field) and/or experience in signal processing

## **Other job related information**

- Travel to other campuses of the University may be required
- There may be a requirement to work additional hours from time to time
- There may be peak periods of work during which taking of leave may be restricted

## **Legal compliance**

Ensure you are aware of and adhere to legislation and University policy relevant to the duties undertaken, including: Equal Employment Opportunity, supporting equity and fairness; Occupational Health and Safety, supporting a safe workplace; Conflict of Interest (including Conflict of Interest in Research); Paid Outside Work; Privacy; Research Conduct; and Staff/Student Relationships