



# RESEARCH FELLOW IN COMPUTATIONAL ASTROPHYSICS

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| DEPARTMENT/UNIT               | School of Physics and Astronomy |
| FACULTY/DIVISION              | Science                         |
| CLASSIFICATION                | Level A                         |
| DESIGNATED CAMPUS OR LOCATION | Clayton campus                  |

## ORGANISATIONAL CONTEXT

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At [Monash](#), work feels different. There's a sense of belonging, from contributing to something groundbreaking – a place where great things happen. You know you're part of something special and purposeful because, like Monash, your ambitions drive you to make change.

We have a clear purpose to deliver ground-breaking intensive research; a world-class education; a global ecosystem of enterprise – and we activate these to address some of the [challenges](#) of the age, Climate Change, Thriving Communities and Geopolitical Security.

We welcome and value difference and [diversity](#). When you come to work, you can be yourself, be a change-maker and develop your career in exciting ways with curious, energetic, inspiring and committed people and teams driven to make an impact – just like you.

Together with our [commitment to academic freedom](#), you will have access to quality research facilities, infrastructure, world class teaching spaces, and international collaboration opportunities.

We champion an [inclusive workplace culture](#) for our staff regardless of ethnicity or cultural background. We have also worked to improve [gender equality](#) for more than 30 years. Join the pursuit of our purpose to build a better future for ourselves and our communities – [#Changelt](#) with us.

The five Schools of the Faculty of Science 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. The Faculty of Science has a strong research reputation. The Faculty's research spans the theoretical to

the applied, contributing 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.

The School of Physics and Astronomy is a School located within the Faculty of Science. It aims to position itself as one of the top physics and astronomy research and teaching departments in Australia. The School is committed to teaching and research of the highest quality in astronomy, astrophysics, experimental physics, and theoretical physics.

Monash and the Faculty of Science values staff diversity and champions inclusive practices. We are committed to equitable decision making and apply the principles of achievement relative to opportunity in our selection processes.

## POSITION PURPOSE

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A Level A research-only academic is expected to contribute towards the research effort of the University and to develop their research expertise through the pursuit of defined projects relevant to the particular field of research.

This position is part of the ARC Discovery Project “On the origin of very massive black holes” led by A/Prof Bernhard Mueller, Prof Alexander Heger, and Partner Investigator Asst Prof Takashi Moriya (National Astronomical Observatory of Japan). As a Level A Research Fellow, you will conduct research related to stellar evolution, supernova explosions and black hole formation in the regime of pulsational pair-instability and pair-instability supernovae. You will also be expected to connect to the broader activities of the Monash Stellar Explosions group and its international collaborators in supernova theory, stellar evolution, nucleosynthesis, and multi-messenger astronomy.

**Reporting Line:** The position reports to an Associate Professor within the School

**Supervisory Responsibilities:** Not applicable

**Financial Delegation:** Not applicable

**Budgetary Responsibilities:** Not applicable

## KEY RESPONSIBILITIES

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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 their research project(s)
6. 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
7. Advice within the field of the staff member's research to postgraduate students
8. Other duties as directed from time to time

## KEY SELECTION CRITERIA

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### Education/Qualifications

1. The appointee will have:
  - an Honours degree or higher qualifications in the relevant discipline and/or progress towards a doctorate in the relevant discipline; or
  - a doctoral qualification in the relevant discipline or a closely related field.

### Knowledge and Skills

2. Demonstrated analytical and manuscript preparation skills; including a track record of refereed research publications in computational astrophysics or related fields.
3. Ability to solve complex problems by using discretion, innovation and the exercise diagnostic skills and/or expertise
4. Well-developed planning and organisational skills, with the ability to prioritise multiple tasks and set and meet deadlines
5. Excellent written communication and verbal communication skills with proven ability to produce clear, succinct reports and documents
6. A demonstrated awareness of the principles of confidentiality, privacy and information handling
7. A demonstrated capacity to work in a collegiate and professional manner with other staff in the workplace
8. Expertise in astrophysical computational fluid dynamics and/or radiative transfer
9. Expertise in the theory of supernova explosions and/or stellar evolution
10. Experience in software development with larger scientific codes; in particular, expertise in Fortran, C, Python, and/or build systems are of advantage.

## OTHER JOB RELATED INFORMATION

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- 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

## GOVERNANCE

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Monash University expects staff to appropriately balance risk and reward in a manner that is sustainable to its long-term future, contribute to a culture of honesty and integrity, and provide an environment that is safe, secure and inclusive. Ensure you are aware of and adhere to University policies relevant to the duties undertaken and the values of the University. This is a standard which the University sees as the benchmark for all of its activities in Australia and internationally.