MONASH University

Position description

Research Fellow

Position number	50138898
Department/Unit	School of Physics and Astronomy and Faculty of Information Technology
Faculty/Division	Faculty of Science and Faculty of Information Technology
Classification (salary rates)	Level A
Work location	Clayton campus
Date document created or updated	

Organisational context

Monash is a university of transformation, progress and optimism. Our people are our most valued asset, with our academics among the best in the world and our professional staff revolutionising the way we operate as an organisation. For more information about our University and our exciting future, please visit www.monash.edu

This is a joint position, based both in the School of Physics and Astronomy within the Faculty of Science as well as the Faculty of Information Technology.

The **Faculties of Science** and **Information Technology** contribute to the university's goals via research, teaching and partnerships with industry, government and individual supporters. The Faculty's schools cover a large and diverse range of disciplines in undergraduate and postgraduate courses. The world-class research carried out in these Faculties spans the theoretical to the applied, contributes to new knowledge and technologies, and challenges how we interact with the world.

The **School of Physics and Astronomy** has very active theoretical, computational, and experimental physics programmes. Current areas of research include: condensed matter physics, ultra-cold atomic gases, atom, electron and x-ray optics, particle physics, and astrophysics & cosmology. The School has access to the university's cluster and grid computing facilities, and has access to major supercomputing facilities. Currently the School has 26 academic staff, 28 research-only staff and 17 adjunct staff, supported by 10 professional staff. In 2014 the School's total recurrent income was approximately $15M, with research income in the past four years exceeding $22M.

The **School of Physics and Astronomy** provides a vibrant environment for research in stellar physics and nucleosynthesis. In addition to Professor John Lattanzio the appointee will have the opportunity to interact with nuclear astrophysicists Professor Alexander Heger and Dr Amanda Karakas. The group are active members of the GALAH project, dedicated to the field of galactic archaeology, which provides the data for the current investigation.

The **Faculty of Information Technology** is uniquely placed in Australia to provide world-class research and facilities. The 2015 round of Excellence in Research for Australia ranked Information Technology research at Monash University as "above world standard". The 2015 Shanghai Jiao Tong Rankings of Computer Science Universities, ranked Monash in Australia's top 2 or 3 universities in Computer Science and among the world's top 150. Minimum Message Length (MML) research at Monash dates from the original paper by Wallace and Boulton in 1968.

Further information about the position and the host Schools is available at: http://www.physics.monash.edu.au/ and http://www.infotech.monash.edu.au/about/schools/clayton/

Position purpose

The Research Fellow will conduct research in the minimum message length method and its applications to galactic archaeology, studying mixture modelling, latent factor analysis and underlying patterns in the GALAH spectroscopic data. This will involve theoretical work in statistics and machine learning. The Research Fellow is expected to publish papers in high-impact journals, present results at major conferences, and to assist in the supervision of PhD and Honours students in the School of Physics and Astronomy and/or the Faculty of Information Technology.

Reporting Line: The position reports to Professor John Lattanzio (Physics and Astronomy) and Associate Professor David Dowe (Faculty of Information Technology, Clayton).

Supervisory responsibilities: Nil

Financial delegation and/or budget responsibilities: Nil

Key responsibilities

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

- the conduct of research in MML, Bayesian statistical inference, machine learning and nuclear astrophysics under limited supervision either as a member of a team or, where appropriate, independently
- the production or contribution to the production of conference and seminar papers and publications from that research
- involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise
- limited administrative functions primarily connected with the area of research of the academic
- development of a limited amount of research-related material for teaching or other purposes with appropriate guidance from other staff
- occasional contributions to teaching in relation to her/his research project(s)
- attendance at meetings associated with research or the work of the organisational units to which the research is connected and/or at departmental, school and/or faculty meetings and/or membership of a limited number of committees; and advice within the field of the staff member's research to postgraduate students

Key selection criteria

Essential

1. The appointee should possess a PhD (or equivalent) in a relevant discipline, such as Statistics, Mathematics, Machine Learning, Computer Science, Econometrics, Electrical Engineering, Physics or Astrophysics from a recognised university
2. Ability to solve problems through innovative solutions
3. Excellent written communication and verbal communication skills with proven ability to effectively analyse information and produce clear, succinct reports and documents which requires interaction with others
4. Planning and organisational skills, with the ability to prioritise multiple tasks and set and meet deadlines
5. Proficiency with computer programming and willingness to learn new programming tools as appropriate

Highly Desirable

6. A strong background and expertise in statistical inference
7. Expertise in the Minimum Message Length method
8. A record of publications in high-impact physics, mathematics or computer science journals

Other job-related information

- Travel, both domestic and international, may be required.
- Shift work, overtime and out of hours work (including evenings, weekends and public holidays) may be required.
- There may be peak periods of work during which the 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.