

RESEARCH FELLOW

DEPARTMENT/UNIT	School of Mathematics
FACULTY/DIVISION	Faculty of Science
CLASSIFICATION	Level A
DESIGNATED CAMPUS OR LOCATION	Clayton campus

ORGANISATIONAL CONTEXT

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 School of Mathematics is one of the largest of the five Schools in the Faculty, and has close working collaborations with other Schools/Departments such as Physics and Astronomy, Data Futures, and Earth, Atmosphere and Environment, and other faculties such as Business and Economics, Arts, Medicine, Information Technology and Engineering. The School has strong links with outside institutions such as CSIRO, the Defence Science and Technology Organisation, and the National Australia Bank and a large number of research institutes and universities around the world.

The School is multidisciplinary with very active groups in algebra and discrete mathematics, analysis and geometry, topology, applied mathematics, financial mathematics, fluid dynamics, statistics and stochastic processes, numerical analysis and scientific computing, PDEs, operations research, optimisation, machine learning, and mathematical biology. The School provides undergraduate teaching for students in the Faculties of Science, Engineering and Information Technology, as well as postgraduate training in its key areas of research. The School has approximately 60 Academic and Research staff, 150 Teaching Associates, 6 Professional staff, 60 PhD and 60 Masters Students.

POSITION PURPOSE

A Level A research-only academic is expected to carry out independent and/or team research within the field in which they are appointed and to carry out activities to develop their research expertise relevant to the particular field of research.

A successful candidate will (a) engage in developing advanced numerical discretisations for multiphysics PDEs, with emphasis on the mathematical and computational aspects of problems with dynamic interfaces; (b) work closely under the guidance of Prof Santiago Badia and Prof Ricardo Ruiz Baier; (c) disseminate results through specialised research articles and technical presentations. While we are welcoming applicants from different research backgrounds, preference will be given to candidates with experience in the analysis and implementation of finite element and similar methods.

This research is supported by the Australian Research Council and its objective is the development and analysis of novel nonlinear, multiphysics, and multiscale PDE systems modelling the electromechanics of heart and torso, and to employ the combination of these numerical techniques and models to deliver predictive tools for patient-specific simulations of the cardiac function. The candidate will integrate all these developments into the Gridap project, a parallel Julia code for grid-based approximation of PDEs.

Review of applications will begin immediately, and applications will be accepted until the position is filled.

Reporting Line: Prof Santiago Badia

Supervisory Responsibilities: Not applicable

Financial Delegation: Not applicable

Budgetary 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 their 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
9. Other duties as directed from time to time

KEY SELECTION CRITERIA

Education/Qualifications

1. The appointee must have a PhD in Mathematics, Physics, Engineering or a related field. Applicants must have a strong theoretical background in the numerical approximation of PDEs using finite element methods and expertise in the efficient implementation of these algorithms.

Knowledge and Skills

2. Strong background in numerical analysis and scientific computing. Candidates must have wide experience in the numerical approximation of partial differential equations using finite element methods and their numerical analysis. Expertise in the efficient implementation of these algorithms is also essential.
3. Computer skills using Linux shell, git, GitHub, etc. Experience implementing numerical algorithms using Julia, Python, C, C++, or FORTRAN
4. Demonstrated manuscript and research proposal preparation skills; including a solid track record of refereed research publications
5. Experience in successfully supervising, mentoring and coaching to support the development of research staff and/or a demonstrated trajectory of leadership capability
6. Experience in supervising and working with major honours or postgraduate students within the discipline
7. The ability to work both independently in a research environment and as part of an interdisciplinary research team
8. High level organisational skills, with demonstrated capacity to establish and achieve goals
9. Excellent written and oral communication skills
10. A demonstrated capacity to work in a collegiate manner with other staff in the workplace

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
- A current satisfactory Working With Children Check is required

GOVERNANCE

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.