



# RESEARCH FELLOW

DEPARTMENT/UNIT	Department of Mechanical and Aerospace Engineering
FACULTY/DIVISION	Faculty of Engineering
CLASSIFICATION	Level A
WORK LOCATION	Clayton campus

## ORGANISATIONAL CONTEXT

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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 Engineering** is one of the largest in Australia, renowned worldwide for the quality and calibre of our teaching, research and graduates. We offer a comprehensive range of undergraduate, graduate, postgraduate and higher degree by research programs in a wide range of engineering disciplines. Our research activities provide a platform for establishing a thriving educational enterprise and our staff are committed to creating a dynamic learning environment. The research activities range from fundamental studies to research with a strong applications orientation. To learn more about the Faculty of Engineering, [please visit our website](#).

The **Department of Mechanical and Aerospace Engineering** aims to educate the next generation of leaders in the profession of mechanical engineering, generate new knowledge and insight into the processes that govern our discipline, and provide service to the community, our profession and industry. We are the largest department within the Faculty in terms of student numbers, offering a range of undergraduate and higher degree programs and a strong and ever-growing contingent of students working towards a PhD or Master's degree. Research is a vital part of the Department's activities and we are renowned for our expertise and world-class facilities. For more information about our Department and the work we do, [please visit our website](#).

## POSITION PURPOSE

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The appointee is required to support and conduct research activities in the Laboratory for Turbulence Research in Aerospace and Combustion (LTRAC) working on setting up complete particle image velocimetry (PIV) experiments to investigate particle-laden swirling jet flows working under the broad direction of the Professor of Mechanical and Aerospace Engineering. The nature of the work to be undertaken is specifically in the following areas of research: (i) designing appropriate optical PIV arrangements to simultaneously measure the fluid flow field and particle velocity distribution, (ii) developing as necessary micro-processor control software programs for the PIV experiments, (iii) developing interface software programs to acquire PIV images from a variety of camera sensors, (iv) developing image-processing algorithms using high level programming languages like C/C++ and/or python to

determine the fluid velocity fields and the particle velocity distributions and concentration, (v) develop post-processing tools using high level programming languages like C/C++ and/or python to analyse the complex PIV data sets of the particle-laden swirling jet flows and (vi) write journal papers reporting the research and present the results of this research at international conferences. You will also assist in managing the day-to-day operations of the LTRAC laboratories and be responsible for maintaining and repairing the Class IV lasers.

**Reporting Line:** The position reports to the Professor of Mechanical and Aerospace Engineering under broad direction

**Supervisory Responsibilities:** Not Applicable

**Financial Delegation:** Not Applicable

**Budget 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. 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

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### Education/Qualifications

1. The appointee will have:
  - A doctoral qualifications in the relevant discipline or a closely related field

### Knowledge and Skills

2. Demonstrated analytical and manuscript preparation skills
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 manner with other staff in the workplace
8. Demonstrated computer literacy and proficiency in the production of high-level work using software such as Microsoft Office applications and specified University software programs, with the capability and willingness to learn new packages as appropriate
9. Thorough knowledge in mechanical or aerospace engineering specifically with experience and specialist expertise and a strong background in the fundamentals of turbulent jet flow physics, experimental Fluid Mechanics and the development, application and practice of PIV, experience in laboratory management and the operation, usage, maintenance and repair of Class IV lasers

## **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

## **LEGAL COMPLIANCE**

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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.