



# RESEARCH FELLOW – SCANNING TUNNELING MICROSCOPY OF TOPOLOGICAL INSULATORS

DEPARTMENT/UNIT	School of Physics and Astronomy, ARC CoE in Future Low-Energy Electronics Technologies (FLEET)
FACULTY/DIVISION	Faculty of Science
CLASSIFICATION	Level A
DESIGNATED CAMPUS OR 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 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, 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 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. We are strongly committed to improving the diversity of our staff and students, and promoting a culture of equality, fairness, respect and openness. In 2015, the School received a Bronze Pleiades Award - Recognising Commitment to Advancing Women in Astronomy. This is an important first step in affirming women within the School, one that we can build upon. Please visit [www.monash.edu/science/schools/physics](http://www.monash.edu/science/schools/physics).

The **ARC CoE in Future Low-Energy Electronics Technologies (FLEET)** is an international innovator in novel electronics technologies. Enabled by the new science of atomically thin materials, FLEET brings together over 40 world-leading experts to develop a new generation of ultra-low power devices. The team is highly interdisciplinary with high-profile researchers from atomic physics, condensed matter physics, materials science, electronics, nanofabrication and atomically thin materials.

With over \$40M investment from the ARC and contributing organisations, FLEET is poised to make significant global impact in the electronics and energy sectors. By building strategic and strong partnerships with Australian and international industry, research institutions and government, FLEET aims to build capacity for advanced electronics research in Australia and train the workforce for the next generation of electronic materials researchers and future semiconductor industry. To learn more about FLEET, please visit our website: [www.fleet.org.au](http://www.fleet.org.au).

## 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.

The Research Fellow conducts research in experimental condensed matter physics and surface science. The position synthesizes novel two-dimensional and three-dimensional topological materials via molecular beam epitaxy, and study their electronic properties using scanning tunneling microscopy and spectroscopy, as well as electronic transport measurements. As part of ARC Centre of Excellence in Future Low-Energy Electronics Technologies, the Research Fellow collaborates with theoretical and experimental scientists in FLEET.

The Research Fellow is expected to publish papers in high-impact journals, present results at major conferences and workshops, and to assist in the supervision of PhD and honours students in the Centre.

**Reporting Line:** The position reports to a Senior Academic, School of Physics and Astronomy, Faculty of Science

**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. Conducting 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. Establishing a programme of high-quality research in experimental condensed matter physics into the electronic properties of topological materials
3. Supervising the operation of two ultra-high vacuum and low-temperature scanning tunnelling microscopes, including one with integrated molecular beam epitaxy system
4. Involvement in professional activities including, subject to availability of funds, including attendance at conferences and seminars in the field of expertise
5. Contributing at least 20 hours per year towards outreach activities
6. Actively participating in FLEET research, mentoring and professional development programs
7. Attending FLEET workshops, seminars and 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. Providing advice and mentorship to undergraduate and postgraduate students within the field of the staff member's research
9. Limited administrative functions primarily connected with the area of research of the academic (e.g., the preparation of competitive grants)

10. Co-supervision of major honours or postgraduate research projects within the field of the staff member's area of research
11. Occasional contributions to supervision/teaching in relation to her/his research project(s)
12. Other duties as directed from time to time

## **KEY SELECTION CRITERIA**

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### **Education/Qualifications**

1. The appointee will have:
  - A doctoral qualification in experimental condensed matter physics or a relevant discipline or a closely related field.

### **Knowledge and Skills**

2. Strong background and expertise in ultra-high vacuum surface science techniques, particularly scanning tunnelling microscopy and/or molecular beam epitaxy
3. Demonstrated analytical and manuscript preparation skills; including a track record of high-impact, peer-reviewed publications in experimental physics, surface science and/or materials growth
4. Ability to solve complex problems by using self-direction, innovation and the exercise of diagnostic skills and/or expertise
5. Well-developed planning and organisational skills, with the ability to prioritise multiple tasks and set and meet deadlines
6. Excellent written and verbal communication skills with proven ability to effectively analyse information, communicate the aims and outputs of research projects in a range of formats including formal and informal oral presentations, refereed research papers and reports
7. A demonstrated awareness of the principles of confidentiality, privacy and information handling
8. A demonstrated ability to work independently in a research environment (with limited supervision) and as part of an interdisciplinary research team in a collegiate manner
9. Demonstrated computer literacy appropriate for scientific research and proficiency in computerized data acquisition and analysis

## **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
- A current satisfactory Working With Children Check is required

## **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.