RESEARCH FELLOW IN THE ELECTRONIC PROPERTIES OF TWISTED 2D SEMICONDUCTORS

DEPARTMENT/UNIT: School of Physics and Astronomy

FACULTY/DIVISION: Faculty of Science

CLASSIFICATION: Level A

DESIGNATED CAMPUS OR LOCATION: Clayton campus

ORGANISATIONAL CONTEXT

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.

The Faculty of Science contributes to the University’s goals via research, teaching and partnerships with industry, government and individual supporters. Our five Schools cover 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 research in the Faculty of Science is carried out by world-class researchers. Their work 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: 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.
POSITION PURPOSE

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 is responsible for conducting research in experimental condensed matter physics and surface science. The Fellow will fabricate van der Waals heterostructures of 2D semiconductors with controlled twist angle, and study their electronic properties using micro- and nano-angle resolved photoemission spectroscopy. The Research Fellow will also work closely with a team to study the electronic structure of twisted 2D semiconductor heterostructures using scanning tunnelling microscopy and low-temperature transport. 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.

Reporting Line: The position reports to the Chief Investigator

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. Establishing a programme of high-quality research in experimental condensed matter physics into the electronic properties of twisted 2D semiconductors

3. Supervising the operation of a van der Waals heterostructure apparatus inside a glove box

4. Planning and executing experiments at user facilities such as the Advanced Light Source and other nano-ARPES beamlines around the world, including applying for beamtime, organizing the beamtime campaign, acting as the on-site spokesperson during the experiment

5. Disseminating the result of the research in high-quality publications and as well as presentations at conferences and seminars

6. Involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise

7. Limited administrative functions primarily connected with the area of research of the academic

8. Co-supervision of PhD students

9. Other duties as directed from time to time
KEY SELECTION CRITERIA

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. Research experience in van der Waals heterostructure fabrication using 2D materials, and photoelectron spectroscopy, particularly angle-resolved photoemission

3. A strong background and expertise in experimental condensed matter physics, particularly in electronic materials

4. A demonstrable record of high-impact, peer-reviewed publications in experimental physics, surface science and/or materials growth

5. Excellent written communication and verbal communication skills with proven ability to produce clear, succinct reports and documents

6. Ability to solve complex problems by using discretion, innovation and the exercise diagnostic skills and/or expertise

7. Other experience in techniques of electronic materials research including materials synthesis, spectroscopic characterization, scanned probe techniques (STM, AFM) will be advantageous

OTHER JOB RELATED INFORMATION

- Travel to other campuses of the University may be required
- Travel to international synchrotrons will 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

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.