RESEARCH FELLOW (ATOMIC-SCALE STRUCTURE DETERMINATION IN THICK NANOSTRUCTURES)

DEPARTMENT/UNIT	School of Physics and Astronomy
FACULTY/DIVISION	Faculty of Science
CLASSIFICATION	Level A
WORK 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 works at the frontiers of research and scholarship, and is committed to high quality teaching and learning; we have numerous partnerships with research institutions, industry, government and individual supporters. Our five Schools offer a large and diverse range of disciplines in undergraduate and postgraduate courses. Our researchers are at the forefront of their fields - conducting research that spans the theoretical to the applied, contributing to new knowledge and technologies, and challenging how we understand and interact with the world. For more information, please visit: 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 we can build on. For more information, please visit https://www.monash.edu/science/schools/physics.

The Monash Centre for Electron Microscopy (MCEM) is a central university research platform that conducts research in electron microscopy and provides advanced instrumentation, expertise and training in electron microscopy to researchers across the non-biological sciences and engineering. MCEM has a suite of advanced instruments, including a double-aberration-corrected Titan3 80-300kV fitted with pixelated and CMOS detectors

for scanning CBED and 4D-STEM. In early 2020, MCEM will install a next generation ultrahigh energy and spatial resolution S/TEM FEG-TEM with a customised electron-optical configuration and high speed single electron and pixelated detectors. For more information, please visit http://mcem.monash.edu.au.

POSITION PURPOSE

The Research Fellow will work on developing methods for atomic-scale structure determination via scanning transmission electron microscopy. This project aims to develop a theoretical and computational toolkit for structure retrieval at atomic resolution that is robust in the presence of multiple scattering ("dynamical diffraction") of the electron probe, and to apply it to large experimental datasets obtained from the new generation of fast-readout electron detectors. The project may draw on methods from inverse scattering theory, phase retrieval, iterative algorithms, machine learning, and high-performance computing.

Reporting Line: The position reports to an academic staff member

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. Undertaking of internationally competitive research in atomic-resolution structure determination via scanning transmission electron microscopy in the presence of multiple scattering
2. Production or contribution to the production of conference and seminar papers and publications
3. Involvement in professional activities including, subject to availability of funds, attendance and presentation at international scientific conferences and seminars, participation in outreach activities, and seminars and colloquia at other universities in Australia and internationally
4. Limited administrative functions primarily connected with the area of research of the academic
5. Active participation in, potentially including co-supervision of, major honours or postgraduate research projects within the field of the staff member's area of research
6. A small amount of teaching into Honours and Masters courses within the field of the staff member's area of research and/or into undergraduate physics courses
7. Involvement in fostering research collaboration and research opportunities with other groups within Monash University, Australia and internationally
8. 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

KEY SELECTION CRITERIA

Education/Qualifications

1. The appointee will have:
    - A doctoral qualification in physics or materials engineering or a closely related field

Knowledge and Skills

2. Research experience in the theory and simulation of high-resolution electron microscopy imaging and/or aberration-corrected scanning transmission electron microscope data acquisition and analysis

3. A demonstrated aptitude for research with a sound record of publication, commensurate with experience and opportunities
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. Demonstrated experience in manipulating, processing and analysing electron microscopy images/data, including coding in Fortran, Matlab, Python or similar
7. A demonstrated capacity to work in a collegiate manner with other staff in the workplace

OTHER JOB RELATED INFORMATION

- 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.