



Electron Microscope Unit

Australian Key Centre for Microscopy and Microanalysis

Australian Microscopy & Microanalysis Research Facility (AMMRF)

ARC Centre of Excellence for Design in Light Metals

PhD Scholarship in Nanofabrication

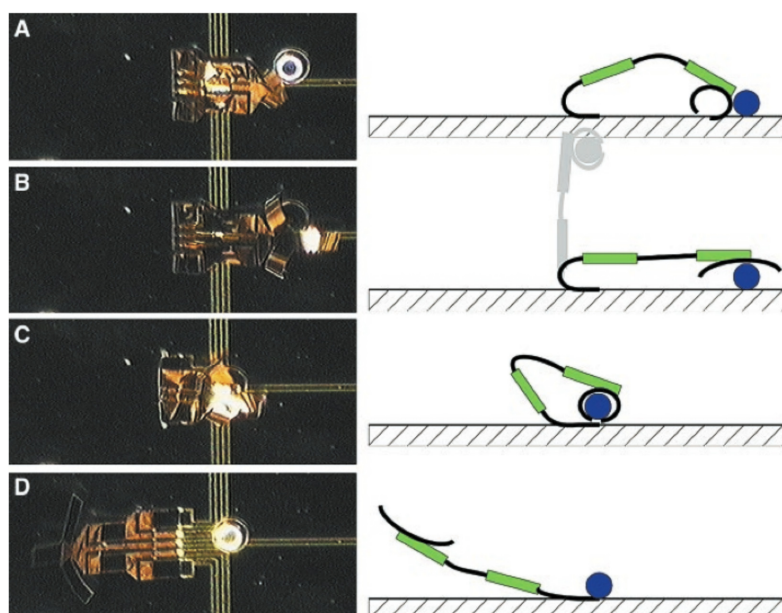
A PhD studentship is available for an enthusiastic student interested in nano-fabrication. This project aims to establish methods to produce functional micro/nano devices with embedded actuation. Micro/nano-sized devices, based on electroactive polymer (EAP) actuators that will operate both in aqueous and non-aqueous media will be produced by combining focused ion beam milling, electron beam lithography and scanning probe lithography techniques, supported by modelling analysis and simulation modules. While the most tangible output of the project will be a prototype nano-actuator device, the main motivations for the project are to:

- develop efficient fabrication methods to produce complex 3-D micro and nano-structures incorporating functional materials, and
- understand the fundamental performance of micro and nano-scale actuators fabricated from electroactive polymers.

The project fits broadly into the area of micro-electromechanical systems (MEMS), a multi-billion dollar industry. While most current MEMS products are sensors, there is a growing industry based around MEMS actuators. Example products include inkjet print heads, microfans and valves and pumps for microfluidics. Actuator devices using electroactive polymers (EAPs) have been extensively developed at the macro-scale and an elegant example of a micro-robot articulated with conducting polymer (CP) actuators that has recently gained considerable attention is shown in the figure below. The figure shows a microrobot fabricated from conducting polymer-gold bilayers grabbing and lifting a 100 μ m glass bead.

This project will be conducted in collaboration with researchers from the Centre of Excellence for Electromaterials Science at the University of Wollongong. There is significant opportunity for international travel in the 2nd and 3rd years of the project. We are looking for a strongly motivated person who is keen to publish in peer-reviewed journals as well as to present at national and international conferences. The student will conduct research in a supportive and intellectually stimulating environment and will be required to exchange ideas and problems with the current diverse team of researchers and fellow PhD students.

A stipend up to \$25,000 p.a. is available, depending on the experience of the student. APA/UPA awardees will be given additional top-up of up to \$8000 p.a.



Further Information:

Dr Julie Cairney

Senior Lecturer

Materials Characterisation

Phone: +61 2 9351 2348

Email: j.cairney@usyd.edu.au

Australian Key Centre for Microscopy and Microanalysis

The University of Sydney

NSW 2006, Australia