



CENTRE FOR QUANTUM COMPUTER TECHNOLOGY

AUSTRALIAN RESEARCH COUNCIL CENTRE OF EXCELLENCE

Position Description - Research Fellow/Senior Research Fellow (Four-probe Scanning Tunneling Microscopy for Atomic-Scale Device fabrication)

School/Unit: Atomic Fabrication Group, School of Physics

Faculty/Division: Science and Technology

Salary: The salary range for the Research Fellow is A\$68,320 – A\$80,541 per year and the salary range for the Senior Research Fellow is A\$82,982 – A\$95,202 per year (plus 17% employer superannuation plus leave loading) depending on qualifications and experience.

Reference Number: 5006

Closing Date: 25 July 2007

Position Description

Development of a new four-point STM system (Omicron Nanoprobe system) for the fabrication and electrical characterization of atomic and molecular scale devices patterned by scanning tunneling microscopy. This position will involve high resolution STM imaging, device design, process development and *in-situ* electrical measurement using the new Nanoprobe scanning probe system in the Atomic Fabrication Facility. The electrical results from these *in-situ* measurements will then be compared with *ex-situ* measurements of devices using cryogenic systems within the School of Physics. Initial studies will concentrate of P:Si systems. Once characterized, the project will extend to other materials including other dopants, metals and organic systems on silicon.

Duties

- Fabrication by STM, processing and measurement of atomic and molecular devices as set out in the ARC Discovery proposal – “*Fundamental conduction mechanisms in atomic-scale silicon devices*”
- Assisting the AFF Director (Prof. M.Y. Simmons) in the supervision of research students at the Centre.
- Technical oversight and management of the Omicron Nanoprobe STM system at UNSW.

Statistics

- Supervision of up to 2 PhD students and 1-2 possible Honours students.
- Responsible for the management of an Omicron Nanoprobe STM system valued at approximately A\$2M.

Reporting Relationships

Supervisor's Title: Professor Michelle Simmons, Federation Fellow and Director of the Atomic Fabrication Facility

Positions reporting to the supervisor: 2 Senior Research Associates
4 Postdoctoral Research Associates
Technical Manager, Atomic Fabrication Facility

Positions reporting to this position: None.

Principal Accountabilities

- Attainment of relevant Project Milestones, as set by Prof M.Y. Simmons
- Publication and dissemination of internationally significant research.
- Supervision and training of research students, ensuring high quality research.

Minimum Education Required

PhD (or equivalent) in Physics, Electrical Engineering or Surface Science.

Essential Criteria:

PhD (or equivalent) in Physics, Electrical Engineering or Surface Science. Strong background and evidence of high quality research in ultra-high vacuum STM, particularly involving Si surfaces. A detailed understanding of surface chemistry on silicon surfaces. Experience in hydrogen resist lithography, device processing and measurement is desirable. Training in the use of Nanoprobe 4-probe STM systems is also highly desirable. More than 3 years post-doctoral experience necessary for Senior Research Fellow position. A knowledge of equity and diversity principles.

Application Procedure

Applicants should submit written applications systematically addressing the selection criteria QUOTING REFERENCE NUMBER. Include business and private telephone numbers; a complete resume, (copies of academic transcript and qualifications where appropriate); and a full list of publications. Applicants should also arrange to have three letters of recommendation sent by the same deadline to both the addresses listed below:

The Recruitment Officer
Human Resources,
UNSW Sydney 2052
email: jobapplications@unsw.edu.au
Facsimile (02) 9662 2832

Professor Michelle Simmons
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