

# Position Description

*School of Physics  
The University of Melbourne*



## RESEARCH FELLOW – ULTRACOLD ATOM ELECTRON SOURCE

<b>Position No:</b>	
<b>Organisation Unit:</b>	<b>School of Physics</b>
<b>Budget Division:</b>	Faculty of Science
<b>Classification:</b>	Level A (PhD entry level)
<b>Salary:</b>	\$61,009 - \$65,589
<b>Superannuation:</b>	Employer superannuation contributions of 9%
<b>Employment Type:</b>	Fixed term – 3 years
<b>Other Benefits:</b>	Salary packaging and staff training and development opportunities.
<b>Current Occupant:</b>	Vacant
<b>Advice to applicants:</b>	Applications must be via the University of Melbourne website <a href="http://jobs.unimelb.edu.au">http://jobs.unimelb.edu.au</a> . Applicants must address the selection criteria available via the website for <a href="#">position_0016856</a> , provide detailed curriculum vitae, and include the names, phone, facsimile numbers and email addresses of three referees, by the closing date.
<b>Closing Date:</b>	29 October 2007
<b>For enquiries contact:</b>	A./Prof. Robert Scholten, tel: +61 3 8344 5457, fax: +61 3 9347 4783, email: <a href="mailto:scholten@unimelb.edu.au">scholten@unimelb.edu.au</a> .

## **2 Position Summary**

This appointee will work within the Centre of Excellence for Coherent X-ray Science in the School of Physics, in the area of atom and x-ray optics. The appointee will work with A/Prof Robert Scholten in partnership with Prof Keith Nugent on a five-year project based on extracting electrons from laser cooled and trapped atoms. The atoms will be photoionised to form an ultracold plasma, from which an electron bunch will be extracted. We will investigate the dynamics of ultracold plasma and frozen Rydberg gas, and factors affecting the emittance and brightness of the electron beam. Inverse Compton scattering of femtosecond laser pulses from the electron bunches will be used to generate X-rays.

We are looking for a highly motivated and independent researcher who can pursue a dynamic research program involving experimental atom optics and optical physics, in collaboration with the chief investigators and a strong team of postgraduate students.

## **2 Selection Criteria**

### **2.1 Essential**

- A PhD or equivalent in physics
- Track record in a relevant area of experimental physics such as laser-atom cooling, ultracold plasma, or Bose-Einstein condensation
- Experimental background with optics, lasers, electronics, scientific imaging, computational data analysis
- A demonstrated aptitude for research and a sound record of publication in relevant areas
- Ability to work to a schedule and meet pre-agreed deadlines
- Excellent communication skills, both written and oral, in English language
- Demonstrated ability to work closely with a team towards a common goal, and independently on specific problems and outcomes
- A willingness to fully participate in all of the activities of the research team
- Professional approach, including effective time management skills, collaborative working hours, positive and constructive attitude, goal-oriented

### **2.2 Desirable**

- Experience in the supervision of students undertaking undergraduate projects and higher degrees
- Expertise with ultrafast lasers and/or charged particle optics

## **3. Special Requirements**

None.

#### **4. Key Responsibilities**

**(i) Research**

Undertake internationally competitive research leading to journal publications and/or patents, and specifically to the defined goals of the funded research project. Also contribute to international conferences in the appropriate fields. The appointee should have a track record commensurate with an appointment to Australia's premier research University.

**(ii) Research Student Supervision**

The School of Physics has a large number of high-quality PhD and MSc students and these students represent a major component of our student load – and major contributors to our research success. The appointee will take an active and enthusiastic role in supervising research students engaged with the project, providing experimental and theoretical guidance, leading to success in their research and that of the group.

**(iii) Professional environment**

The School of Physics takes pride in having a collegiate and cooperative environment. It is expected, therefore, that the appointee will take a willing and energetic role in ensuring that our teaching and research operate at the highest possible standard. The successful appointee will contribute through group meetings, research seminars, journal clubs, postgraduate study groups, School colloquia and other activities aimed at fostering a leading research environment.

#### **Occupational Health and Safety (OHS) and Environmental Health and Safety (EHS) Responsibilities**

All staff are responsible for the following safe work procedures and instructions:

Employees must:

- cooperate with the University in relation to activities taken by the University to comply with OHS and EHS legislation.
- comply with the OHS and EHS manuals
- adopt work practices that support OHS and EHS programs
- take reasonable care for their own health and safety and the health and safety of other people who may be affected by their conduct in the workplace
- seek guidance for all new or modified work procedures
- ensure that any hazardous conditions, near misses and injuries are reported immediately to the supervisor
- participate in meetings, training and other environment, health and safety activities
- not wilfully place at risk the health or safety of any person in the work place
- not wilfully or recklessly interfere with or misuse anything provided in the interest of environment health and safety or welfare

**Supervisors are responsible for:**

- developing new work procedures, as required, in conjunction with relevant persons
- providing all staff with relevant OHS and EHS information in an appropriate manner
- providing personal protective equipment and clothing if hazards cannot be fully eliminated
- providing adequate supervision through technical guidance and support
- identifying and controlling hazardous conditions
- providing appropriate facilities for safe storage, handling and transport of hazardous substances
- ensuring that all accidents and incidents are reported

In addition, **Academic Staff** are responsible for ensuring that an equivalent standard of OHS and EHS is afforded to their students as is afforded to University staff generally. Academic staff are deemed to have principal supervisory duty for undergraduate and postgraduate student activities.

**5 Other Information****5.1 Organisation Unit**

The University of Melbourne's School of Physics is one of Australia's leading physics Schools. It has achieved this status through the high quality of its research and teaching programs. The School offers a wide range of physics subjects to undergraduate and postgraduate students. It is located in a modern building on the Swanston Street boundary of the University campus. The administration area of the School has recently been renovated to provide a vibrant first point of contact for students, staff and visitors, bringing together the Head of School and the administrative team. Currently some 23 academic staff, 28 support staff, 35 research-only staff, and more than 80 postgraduate students make up the School. Skilled technical staff operate, maintain and develop, complex instrumentation and equipment to support the teaching and research activities of the School.

The School has 6 research groups which include: Astrophysics, Experimental Particle Physics, Microanalytical Research Centre, Optics, Theoretical Condensed Matter Physics and Theoretical Particle Physics.

The School of Physics hosts the Centre of Excellence in Coherent X-Ray Science and the Melbourne node of the Centre of Excellence for Quantum Computer Technology. The School also plays a major role in the Australian Synchrotron research program. Other centres that operate within the School are the Micro-Analytical Research Centre and The Research Centre for High Energy Physics and Quantum Communications Victoria.

**5.2 Budget Division**

Established in 1887, the Faculty of Science is one of the University's largest faculties and has approximately 7000 students across its courses. There are four schools and five departments, which include the Schools of Botany, Chemistry, Earth Sciences and Physics, and the Departments of Genetics, Information Systems, Mathematics & Statistics, Optometry & Vision Sciences and Zoology.

The Faculty is a partner in 19 externally funded research centres. These include the Mathematics and Statistics of Complex Systems Centre of Excellence, the Quantum Computing Technology Centre of Excellence, the International Centre of Excellence for Education in Mathematics, The Centre of Excellence in Coherent X-Ray Science and the Centre of Excellence for Free Radical Chemistry and Biotechnology. Funding for Cooperative Research Centres (CRCs) include the CRC for Bioproducts, the CRC for Predictive Mineral Discovery, the CRC for Innovative Dairy Products and the Smart Internet CRC. Involvement in Special Research Centres (SRCs) include the SRC for Particulate Fluids Processing Centre and the SRC for Environmental Stress and Adaptation Research. Funding from the Grains Development Research Council (GRDC) is provided for the GRDC Research Centre for Functional Genomics, and from the ARC/GRDC for the ARC Centre for Functional Genomics. State Government funding via the STI (Science, Technology & Innovation) Initiatives Program supports the Victorian Institute for Chemical Science (VICS), the Victorian Centre for Plant Functional Genomics and the Australian Mathematical Sciences Institute (AMSI). The Statistical Consulting Centre, the Micro-Analytical Research Centre and The Melbourne Experimental Particle Physics group all function as centres within the Faculty.

The Faculty provides integrated programs of teaching, postgraduate training and community activity, all of which are based on a solid foundation of research in both the pure and applied sciences.

The Faculty's international agenda includes joint research ventures, exchange of staff and students, recruitment of overseas students and the inclusion of a global perspective in curricula.

### **5.3 The University of Melbourne**

The University of Melbourne is an international research and teaching university. We employ people of outstanding calibre and offer a unique environment where staff are valued and rewarded.

Founded in 1853, the University commenced teaching its first students in 1855. The University has over 40,000 students in a broad range of professional disciplines. Over 6000 students are higher degree students. The University has over 6000 staff members.

The University is one of Australia's leading research based universities, with an international profile through its reputation for scholarship and teaching. It is a founding member of Universitas 21, an international federation of universities.

The University is committed to equal opportunity in education, employment and welfare for staff and students. Students are selected on merit and staff are selected and promoted on merit.

The Vice Chancellor is the Chief Executive Officer of the University and responsible to Council for the good management of the University. The Academic Board is responsible to Council for academic matters. Reporting to the Vice-Chancellor are the Deans of each Faculty, two Deputy Vice-Chancellors, and the Senior Vice-Principal. Reporting to the Senior Vice-Principal are Vice-Principals of Human Resources, Information, Property & Buildings, and University Development; the Vice-Principal & Chief Financial Officer; the Vice-Principal & General Counsel; and the Vice-Principal & Academic Registrar.

**This position description is approved by:**

Occupant: ..... Date: .....

Supervisor:..... Date: .....

Head of Organisation Unit: ..... Date: .....