POSITION DESCRIPTION:

SWINBURNE UNIVERSITY OF TECHNOLOGY

SECTION A: Position Context

Position Title	Postdoctoral Research Fellow
Position Number	
Classification	Academic Level A
School	Faculty of Engineering and Industrial Science
Division	Higher Education
Effective Date	September 2008

Position Purpose:

An enthusiastic and capable Postdoctoral Research Fellow is sought to work in the Centre for Micro-Photonics (CMP) as part of a collaborative project with the Cooperative Research Centre for Polymers. The new research field straddles the disciplines of photonics and material sciences toward the new generation photovoltaic devices. The focus of the research is to characterise organic dyes both in solution and media for efficient light harvesting. The Postdoctoral Research Fellow will be engaged on a full time basis. The position is funded for a period of two years.

It should be noted the successful applicant will be unable to undertake any activity other than those described in the duty statement below during the designated time of employment without the expressed prior approval and consent of the Director of the Centre for Micro-Photonics.

University Information:

Swinburne University of Technology is a large multi-sectoral and multi-campus institution with a stated mission to be a pre-eminent entrepreneurial university from the Asia-Pacific, thriving on new ideas and knowledge and exploiting its intersectoral heritage to create value for its stakeholders.

Swinburne has campuses in metropolitan Melbourne at Hawthorn, Prahran, Lilydale, Wantirna, Croydon and Healesville and an overseas branch campus in Kuching, Sarawak. It also offers an increasing number of subjects and courses via the Internet. Its programs cover the education and training needs of over 50,000 students ranging from apprentices through to doctoral students.

Swinburne is proud of its close links with industry, business and the community generally. It has gained a prominent and respected name in education in Australia and overseas through:

- government funded programs and research;
- industry and business funded research;
- consultancy and training;
- fee-for-service teaching;
- an international focus for its curricula, student recruitment and operations.

Higher Education
The Higher Education Division located at Hawthorn, Lilydale and Prahran campuses has approximately 15,000 undergraduate and postgraduate students and over 600 academic and other staff. The relatively small size necessitates a focused approach to both course offerings and research activities. The Higher Education Division's mission is to be a research-intensive technological university characterised by:

- Research activities of national prominence and international recognition focussed around the University's chosen areas of excellence
- Students of high academic standard in a range of high quality specialist undergraduate and post-graduate coursework and research programs
- Being international in operation and perspective
- A significant level of self determination arising from a sustainable balance between revenue generating activity and prestige.

The division consists of seven academic units:

- Faculty of Business and Enterprise
- Faculty of Design
- Faculty of Engineering and Industrial Sciences
- Faculty of Information & Communication Technologies
- Faculty of Life & Social Sciences
- Higher Education Lilydale
- Swinburne Sarawak

The Division has a range of undergraduate and postgraduate coursework and research programs focussed around the themes of:

- Professional engineering
- Information technology
- Business and innovation
- Design
- Multimedia
- Health and human services

Faculty
The Faculty of Engineering and Industrial Sciences is responsible for teaching and research in a broad range of disciplines in engineering, mathematics and industrial sciences. The total student load for the Faculty is approximately 1600 equivalent full-time students. The Faculty has 110 academic positions, 20 administrative positions and 10 technical positions. There are over 100 postgraduate research students.
The Faculty has the following formal research centres and Institutes: the Industrial Research Institute Swinburne (IRIS), Centre for Micro-Photonics (CMP), Centre for Applied Optics & Ultra-fast Spectroscopy (CAOUS) and Centre for Infrastructure and Sustainability (CIS).

URL to Web page: http://www.swin.edu.au/feis

Centre Information:

The Centre for Micro-Photonics (CMP) (http://www.swinburne.edu.au/feis/cmp/) was established from the Chancellery Strategic Initiatives Program at Swinburne University of Technology in 2000. In 2005, the CMP was designated as one of the Tier One Centres of the University and ranked 5* in both research quality and impact by each of the four international experts appointed by the University for the 2006 Research Quality Framework Trial Assessment. The aim of the CMP is to develop innovative nanophotonic devices for all-optical information technology, to develop novel optoelectronic imaging methods for biological studies and industrial applications, and to understand mechanisms for light interaction with biological materials. The CMP has two targeted research programs: biophotonics and nanophotonics.

Since the beginning of 2003, the CMP has been a node of the Australian Research Council Centre of Excellence for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS) (www.cudos.org.au). CUDOS, which has eight-

year ARC funding, includes 12 Chief Investigators from the five participating Universities (The University of Sydney, the Australian National University, Macquarie University, University of Technology Sydney, Swinburne University of Technology and RMIT). Its mission is to demonstrate all-optical processing applications and devices for ultra-high bandwidth optical communications systems. These will derive from fundamental research in the most exciting and vibrant areas of photonics science—non-linear optical materials, photonic crystals, micro-structured optical fibres and micro-photonics. The project that CMP is undertaking within the CUDOS is three-dimensional photonic crystals and devices.

The CMP is also a research node of the Cooperative Research Centre (CRC) for Polymers (www.crcp.com.au). The Cooperative Research Centre (CRC) for Polymers is part of the Australian Government's program to promote collaborative research in high priority areas of science and engineering. It focuses on research to deliver the technically advanced polymeric materials and polymer engineering required to transform Australian industries and to establish and expand companies in emerging high-growth areas of the economy. The projects that CMP is undertaking within the CRC for Polymer are high density optical data storage, control of cellular functions and organic photovoltaic devices.

Biophotonics Program

Biophotonics has become a key foundation in biotechnology industry in most of the developed countries and will be one of the important disciplines in the new century. Research in the Centre for Micro-Photonics has the following aspects.

- Optics: femtosecond optics, near-field optics, nonlinear optical microscopy (superesolution), fibre optics, laser trapping.
- Optics and laser in health care: laser-tissue interactions; fibre-optical biosensors, detection and treatment of tumours; laser tweezers in biological studies; confocal microscopy in the biological studies; nonlinear optical endoscopy, photo-therapy with nano-particles, near-filed microscopy in the biological studies; biochips and bioreactors for stem cell research.
- Active near-field microscopy: lasing in micro-cavities; near-field Mie scattering; generation of high-order doughnut laser beam; laser trapping and tweezers.
- Computer-aided visualisation: image processing; computer-aided data acquisition; multi-dimensional image visualisation.
- Cell Biology: research in the cell biology lab involves collaborations between the Centre for Micro-Photonics and the Peter MacCallum Cancer Centre. We utilise photonics expertise to elucidate the mechanisms by which cancer and immune functions are regulated.

Nanophotonics Program

Nanophotonics is a new area which involves the development of photonic devices in the submicro- and nano-scales. High density data storage is one of the key aspects in information technology. The new generation optical data storage devices based on nanostructured materials will break the limit of the three-dimensional optical data storage devices. Photonics crystals - the optical analogues of electronic crystals - are materials patterned with a periodicity in dielectric constant. They provide the opportunity to shape and mould the flow of photonic information technology and generate the next-generation light harvesting devcies. Research in this program is centred in the following areas:

- Nanometry: imaging of quantum dots and nano-particles; single molecule dynamics.
- Nano-fabrication: submicro-resolution imaging and fabrication; plasmonic imaging and fabrication; adaptive optics.
- Multi-dimensional optical data storage in nanocomposite polymers: spectral encoding and polarisation encoding in optical data storage; Holographic optical data storage with nano-particles.
- Photonic crystals: fabrication of new photonic crystals using photo-polymer materials and nonlinear optical materials; Control of radiation dynamics in photonic crystals; development of novel lasers and nano-devices including superprisms.
- Photovoltaics: mate-materials, organic solar cells,

Participation on Committees:

Participation in the project meetings, workshops and seminars and staff meetings in the Faculty, the Centres and others as required.

Supervision Reporting Relationships:

This position' supervisor/manager	The position reports directly to the Director of the Centre for Micro-Photonics, Prof. Min Gu.
Other positions reporting to this position	None

Location:

This position will be located at the Hawthorn campus of Swinburne University of Technology.

SECTION B: Key Responsibility Areas

The key responsibility areas (KRAs) are the major outputs for which the position is responsible and are not a comprehensive statement of the position activities.

	Key Responsibility Areas	
1.	**Research**	▪ Provide enhanced characterisation of organic dyes both in solution and on titanium dioxide. ▪ Develop novel mesoporous nanostructured titanium dioxide nanostructures. ▪ Investigate the development of nanoparticle-based composite transparent conducting electrode materials. ▪ To be involved in the application for new competitive grants. ▪ To build on the potential of the research with national and international collaborations. ▪ To produce or assist in the production of scholarly publications. ▪ To provide advice to undergraduate and postgraduate projects as require ▪ Other duties as directed by the Director of the Centre.
2.	**Administration**	▪

SECTION C: Key Selection Criteria

Application letters and/or resumes must address the **Qualifications,** and **Knowledge/Experience/Attributes** sections found under the key selection criteria. Preferably, applications should not exceed six (6) A4 pages in total.

Qualifications: Include all educational and training qualifications, licences, and professional registration or accreditation, criminal record checks etc. required for the position.		***Essential/ Preferable***
1	Applicants must have a PhD degree in physics, photonics, material science or have qualifications and experience equivalent to this.	***Essential***

Experience / Knowledge / Attributes: Required by the incumbent to successfully perform the positions key responsibilities.	
1	Demonstrated expert knowledge in nanofabrication with femtosecond pulsed lasers, optical microscopy imaging, near-field microscopy and laser spectroscopy. Experience of fluorescence lifetime and resonance energy transfer measurements is highly desirable.
2	Demonstrated high-level inter-personal and communication skills
3	Demonstrated ability to work independently and as part of a team
4	Proven track record of successful research project and a publications record
5	Excellent presentation, technical reporting and scientific written skills
6	Ability to complete complex tasks with minimal supervision and to be accountable for outcomes
7	Ability to effectively collaborate with other researchers

Swinburne Employee Attributes:

Our employee attributes inform the selection process; however, a written response to the attributes is not required. The attributes are:

- ☞Building Organisational Capability
- ☞Builds Relationships
- ☞Creates a Learning Environment
- ☞Demonstrates Personal Integrity
- ☞Drives Service Excellence
- ☞Exhibits Entrepreneurial Skills
- ☞Manages Change Effectively
- ☞Provides Educational Leadership
- ☞Sets Direction

Please click on the following link for information (http://www.swin.edu.au/corporate/hr/attributes/):
Swinburne Employee Attributes

Further Information:

For further information please contact Professor Min GU on telephone +61 3 9214 8776 (mgu@swin.edu.au)

Date Position Description prepared and/or agreed _____*(For internal use on appointment of incumbent)*

Occupant: (If applicable) _____ Date: _____

Signature _____

Supervisor: _____ Date: _____

Signature _____

Head of Department: _____ Date: _____

Signature _____

End of Position Description.

For more information, refer to following attachments/web links:

Recruitment & Selection Guide (http://www.swin.edu.au/corporate/hr/docs/Recruitment_guide.pdf):

Employee Attributes (http://www.swin.edu.au/corporate/hr/attributes/):