June/July 2006

ECIU News
European Consortium of Innovative Universities

ECIU Member Research Profile

Swinburne University of Technology

Melbourne, Australia

As a result of discussion at the November 2005 Board meeting of the ECIU, it was agreed that institutions should provide a series of articles profiling their research strengths and directions. In this way, it was hoped that pathways would be opened to encourage further collaborative research programmes and student/staff exchanges. Such collaborations might also foster the establishment of dual PhD programmes and joint funding applications. This is the first of those articles.

Research growth at Swinburne

In 2008, Swinburne will celebrate its 100th birthday. Established as a technical college in the eastern suburbs of Melbourne, largely focussed on trade skills, it became over the years a highly respected Institute of Technology, producing graduate professionals who were highly sought after by industry and commerce as a result of their practical, vocationally oriented education.

In 1992, Swinburne was granted its Charter as a University and added a research mission to its already excellent teaching programme that included an industry based learning (IBL) component, in which Swinburne was a pioneer. Throughout these transitions, Swinburne has maintained its industry focus and today enjoys strong links with industry and commerce through its research and its IBL programmes.

Another pioneering achievement by Swinburne was the establishment of possibly the world's first Graduate School of Entrepreneurship - a field in which Swinburne has been amongst world leaders for over 20 years - formalising an academic award programme for potential and practising entrepreneurs and a research programme on aspects entrepreneurship and entrepreneurial activity. Thus there is a natural linkage between Swinburne's research and its entrepreneurial culture.

Swinburne is a relatively small university by Australian standards, having some 10,000 undergraduates (in its Higher Education Sector), 650 postgraduate research students and 495 academic staff.

Research strategy

Our primary strategy in developing our research profile has been to concentrate our resources on a limited number of selected areas in which we can be certain of having researchers who are among national and international leaders in their fields and state of the art infrastructure to support them.

Swinburne is also focussed on building its international links, and membership of the ECIU provides unique access to some of Europe's leading research universities.

We have recently designated seven Tier 1 Research Centres following a competitive process, with a further six Tier 2 Centres having aspirations to achieve the performance, research environment and critical mass required of our Tier 1 Centres. The Tier 1 Centres receive strategic funding from the University.

Research esteem

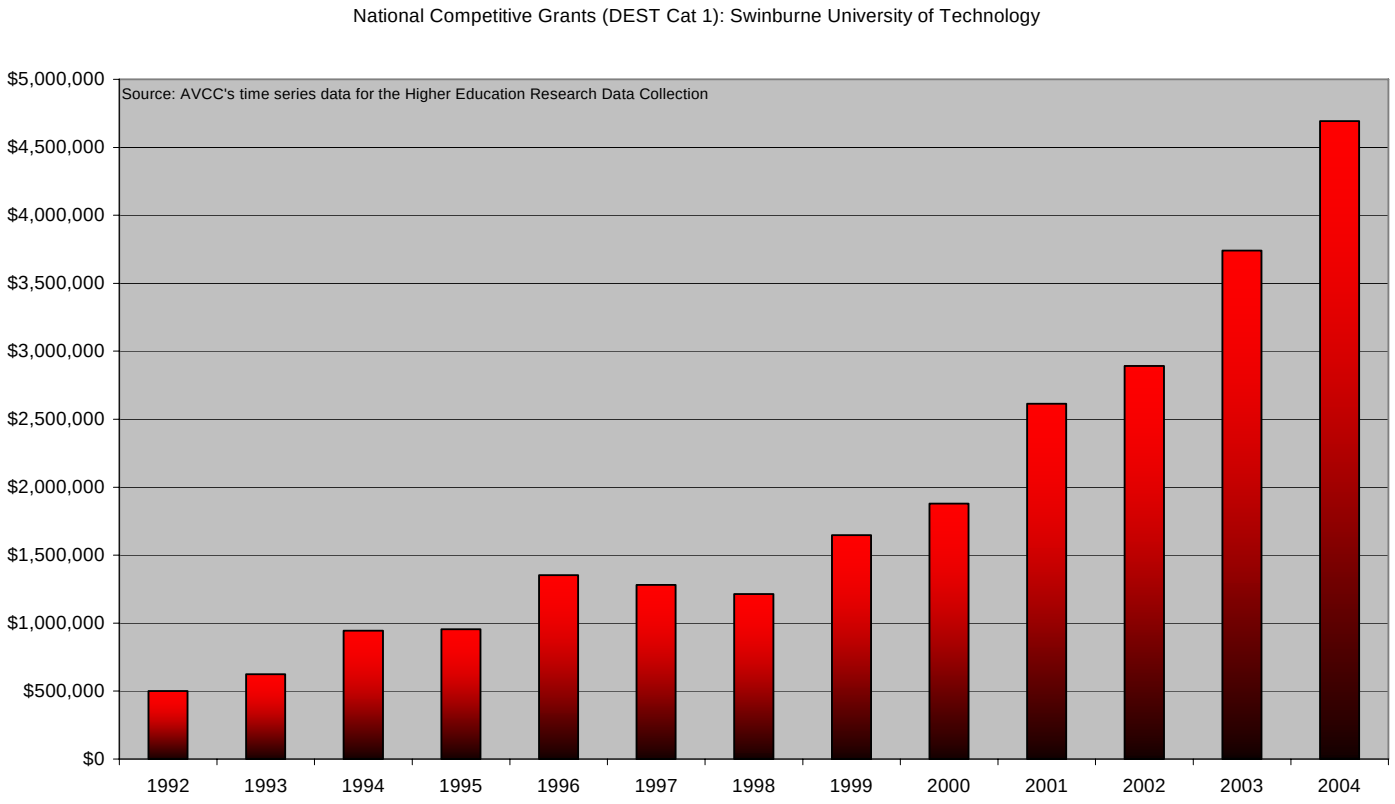
Swinburne has made great strides towards our vision of becoming an internationally respected research-led University of Technology. By most intensive research measures, Swinburne is currently ranked overall in the middle of Australia's 38 Universities, ahead of several much larger and longer established research universities. In last year's round of Australian Research Council (ARC) Grants, Swinburne was ranked 17th in terms of total dollars won. We are a core member in 4 of only 20 ARC Centres of Excellence – the prestigious flagships of the ARC's research programme - and 9 Cooperative Research Centres (CRCs - a Federal Government funding programme bringing together Universities and industry in commercially focussed research and development).

CRCs play an important role in the Australian innovation system by undertaking collaborative research and development programmes that benefit member companies and contribute to national technological and social objectives.

Amongst Australia's eight technological universities, Swinburne is now ranked second on intensive research performance measures.

An indication of the growing esteem in which Swinburne is held can be seen by the growth in Australian Research Council Grants. These grants, awarded on the basis of peer review, are regarded as the prestige research grants in the Australian academic community.

So, this is a remarkable achievement for a University that only 14 years ago had no research profile.



Growth in national competitive grants

Swinburne's Research Centres

Our research strengths are defined by our designated Research Centres. These are:

Tier 1 Centres

- The Centre for Microphotonics (CMP)
- The Centre for Atom Optics and Ultra-fast Spectroscopy (CAOUS)
- The Centre for Astrophysics and Supercomputing
- The Centre for Information Technology Research (CITR)
- The Institute for Social Research (ISR)
- Brain Sciences Institute (BSI)
- Industrial Research Institute Swinburne (IRIS)

Tier 2 Centres

- Environment and Biotechnology Centre (EBC)
- Centre for Molecular Simulation
- Research Centre for Business, Work and Ageing
- Centre for Emerging Technologies and Society
- Centre for Advanced Internet Architecture
- Centre for Sustainable Infrastructure

In addition, Swinburne is developing a research profile in Design (both graphic and industrial) – a discipline that has hitherto not had a universal research presence.

Our Tier 1 Research Centres

The Centre for Microphotonics
Director: Professor Min Gu

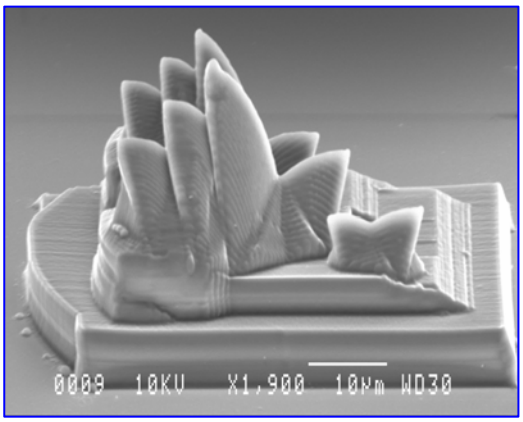
The Centre aims to develop innovative nanophotonic devices for all-optical information technology and novel optoelectronic imaging methods for biological studies, and to understand the mechanisms for light interaction with biological materials.

The research is conducted under two broad programmes:

- The Biophotonics Programme
- The Nanophotonics Programme

The Centre is a part of the ARC Centre of Excellence for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS).

Further information:
http://www.swin.edu.au/bioscieleceng/soll/cmp/



The world's smallest Sydney Opera House - <100 microns long – made from photo-reactive polymer using femtosecond laser pulses

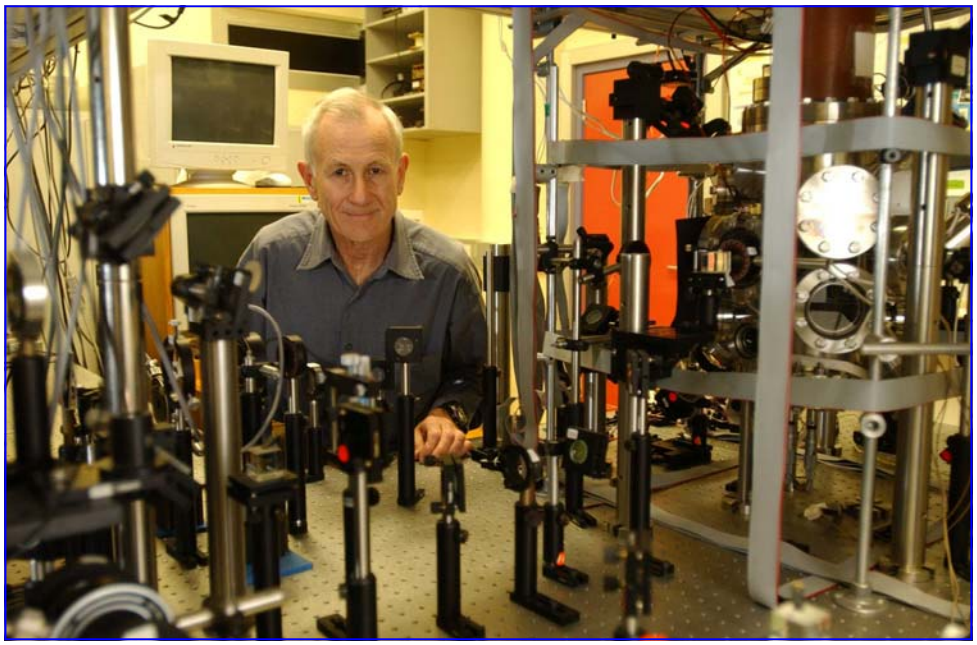
Centre for Atom Optics and Ultra-fast Spectroscopy
Director: Professor Peter Hannaford

The primary objective of the Centre is to carry out fundamental and strategic research in the broad areas of:

- Atom Optics
- Ultra-cold Molecules
- Quantum Information
- Ultra-fast Spectroscopy
- Applied Optics

The Centre is part of two ARC Centres of Excellence – the Centre of Excellence for Quantum Atom Optics (ACQAO) and the Centre of Excellence for Coherent X-ray Science (CXS).

Further information:
http://www.swin.edu.au/bioscieleceng/soll/caous/welcome.htm



Professor Peter Hannaford, Centre for Atom Optics & Ultra-fast Spectroscopy

The Centre for Astrophysics and Supercomputing
Director: Professor Matthew Bailes

Astrophysics research within the Centre spans the entire electromagnetic spectrum covering computational, theoretical and observational astronomy. The Centre operates a significant supercomputing facility and a virtual reality theatre and concentrates on problems in astrophysics that benefit from these unique resources. The Centre has access to the Australia Telescope and the Hubble Telescope.

The research is conducted under six programmes:

- Galaxy Evolution and Cosmology
- Globular Clusters
- Pulsars
- Square Kilometre Array Simulations
- Star and Planet Formation
- Astronomy Visualisation

Square Kilometre Array (SKA) Simulation

Further information:
http://astronomy.swin.edu.au/

The Centre for Information Technology Research
Director: Professor Ryszard Kowalczyk

The Centre undertakes fundamental and applied research in areas contributing to its two major research themes of Reliable Software Systems and Service Oriented Computing.

The research is conducted under seven programmes:

- Complex Intelligent Systems
- Component Software and Enterprise Systems
- Information Systems
- Intelligent Agent and Multi-Agent Systems
- Software Testing
- Web and Data Engineering
- Workflow Technology

Further information: http://www.swin.edu.au/ict/research/citr

The Institute for Social Research
Director: Professor Julian Thomas

The Institute aims to conduct research and consultancy that addresses social issues relevant to Australian society, to inform government and other agencies and to contribute to the development of policy for national, state and regional governments.

The research is conducted under five programmes:

- Citizenship and Government
- Media and Communications
- Cities and Housing
- Philanthropy
- Gender and Cultural Diversity

The Institute is a member of the ARC Centre of Excellence for Cultural and Media Industries.

Further information:
http://www.sisr.net/index.html

The Brain Sciences Institute
Director: Professor Con Stough

The principal aim of the Brain Sciences Institute (BSI) is to conduct research in human neuroscience and to advance knowledge in this area. The Institute brings together a multi-disciplinary team of researchers across several different disciplines and areas of expertise that includes physicists, psychologists, psychophysiologists, biophysicists and neuroscientists. The research is conducted under 11 programmes:

- Cellular neuroscience
- Drugs & Driving
- Human Electromagnetic Energy Bioeffects
- Instrumentation
- Clinical & Forensic Psychology
- Herbal and Nutritional Medicine
- Emotional Intelligence
- Biology of Individual Differences
- Ageing
- Developmental Disorders
- Visual and Cognitive Neurosciences

Further information: http://www.swin.edu.au/lss/bsi/index.html

The Industrial Research Institute (Swinburne)
Director: Professor Milan Brandt

IRIS has as its aim the provision of a complete range of applied research and technology diffusion to industry. In addition to research and development, the range of services includes feasibility studies, design and testing of developments, and customized short term training.

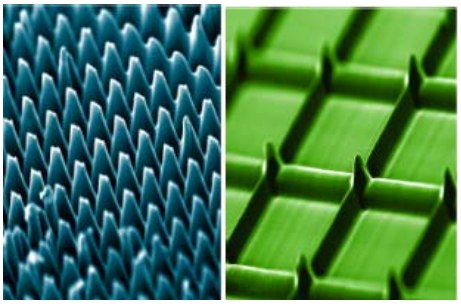
It also has an important educational role in providing postgraduate courses in niche areas of relevance to industry.

The research component is conducted under five programmes:

- Intelligent Manufacturing Systems
- Laser Technology
- Microtechnology
- Microwave Technology
- Robotics and Non Contact Inspection

IRIS is a member of seven CRCs.

Further information:
http://www.swin.edu.au/iris/



50 micron high chisels and spikes machined using mask dragging

In-situ Laser resurfacing of turbine blades

Information about the Tier 2 Centres can be obtained from their websites, accessible through the Faculties and Schools link on the Swinburne Home page:
http://www.swin.edu.au

The Pro Vice-Chancellor (Research) and the Office of Research

The Pro Vice-Chancellor (Research) (PVC(R) has responsibility for the development and coordination of research and research policy across the University. The PVC(R) is supported by the Office of Research. The PVC(R) is Professor Kerry Pratt (email: kpratt@swin.edu.au).

The Director of the Office of Research is Ms Sandra Mosca (email: smosca@swin.edu.au).

Both Professor Pratt and Ms Mosca would be delighted to answer any questions about research at Swinburne or to direct would-be collaborators to appropriate researchers or units within the University.

Information about research in general and research Policies of the University can be accessed via the research link on the Swinburne home page.

Postgraduate research training and administration is managed by the Office of Graduate Studies led by Assoc. Professor Pam Green (email: pamgreen@swin.edu.au)

Management of intellectual property and commercialisation is the responsibility of Swinburne Knowledge, Director: Dr Bruce Whan (email: bwhan@swin.edu.au). Swinburne Knowledge is responsible to the PVC(R) and works closely with the Office of Research.

Swinburne University of Technology is located in Melbourne, Australia's second largest city, rightly voted twice as the world's most liveable city by The Economist magazine.

More on Melbourne can be found from the website: http://www.totaltravel.com.au/travel/vic/melbournearea

Swinburne and Melbourne would warmly welcome any visitors from the ECIU.

Professor Kerry Pratt, Pro Vice Chancellor for Research, Swinburne University of Technology

Next research profile

If you would like to profile your university's research in an ECIU newsletter, please contact Fiona Campbell (fiona.m.campbell@strath.ac.uk) or Saskia Hansen (saskia.hansen@strath.ac.uk) at the University of Strathclyde/ECIU Secretariat.