



## Macquarie University, Sydney, Australia

# RESEARCH OPPORTUNITIES

Macquarie University is committed to being a leader in research. We have recruited strongly to build on our existing strengths in our Concentrations of Research Excellence (COREs).

## A world class university

Ranked among the top nine universities in Australia (*Shanghai Jiao Tong University Academic Rankings of World Universities, 2009*), Macquarie University is a research-intensive university. We open students' minds to the challenges of research and to life-long enquiry.

Our international reputation rests on distinct research areas of the highest quality. We are expanding this through a unique concentration and research recruitment strategy, which added about 100 highly-performing researchers to our staff by the end of 2009.

## Our strategy

*"Our ambition is for Macquarie University to rank amongst the top 200 research-intensive universities in the world by 2014.*

*A pervasive research culture which spans all academic levels, along with our vibrant postgraduate research program and our ongoing commitment to expand our Concentrations of Research Excellence, are all advancing this objective.*

*Our researchers play a critical role in supporting social, cultural and economic advancement in Australia. We regard our higher degree research (especially PhD) candidates as junior researchers and provide generous support to ensure they have the best possible experience during their candidature." says Deputy Vice-Chancellor (Research), Professor Jim Piper (pictured).*

Among the 1,600 or so PhD candidates enrolled in 2009, about a third are international candidates. The majority of our international PhD candidates receive scholarships provided either by government scholarship agencies or our own Macquarie University Research Excellence Scholarship (MQRES).

We are also actively expanding our jointly supervised PhD (Cotutelle or Joint PhD) programs with other research-intensive international universities.



PHOTO: MICHELLE WILSON

## Recent research highlights

- Our publication rate per staff member now ranks in the top three of Australian universities.
- In the Excellence in Research for Australia (ERA) 2009 Trial for the Physical, Chemical and Earth Sciences cluster, Macquarie achieved the top rating (5) in both Physical and Earth Sciences.
- The Australian Government allocated over AU\$36 million from the Education Investment Fund to two high-profile Macquarie projects in advanced surgical training and marine science.
- We are among the top eight Australian Universities to receive Australian Research Council (ARC) grants and funding, with more than AU\$10 million in ARC Discovery grants and additional funding for major equipment and facilities.
- In 2009, we signed Joint PhD agreements with five highly-regarded British universities and several leading universities in Germany and China.
- We increased the Macquarie University Research Excellence Scholarship (MQRES) stipend to AU\$22,500 per annum for 2010, a 10 per cent increase over the 2009 rate.
- Our library provides specific support to researchers and higher degree research students, including dedicated research areas within the new library building (to be opened in 2010).
- We are enhancing our research capacity with major infrastructure developments, including the AU\$180 million Macquarie University Hospital (to be completed in 2010) and the AU\$130 million Hearing Hub (to be completed in 2012).

### DID YOU KNOW?

By end of 2009 we had 72 Cotutelle and Joint PhD agreements with over 51 leading universities in 22 countries. Read more about our Cotutelle and Joint PhDs on the back page of this flyer.

# Concentrations of Research Excellence (COREs)

Macquarie University's international reputation rests on distinct research areas of the highest quality. Currently, there are 18 COREs:

## Ancient Cultures

The breadth of coverage and the integration of source studies with historical research makes Ancient Cultures at Macquarie unique. Our projects advance each of our key areas – excavation (Egypt), inscriptions, numismatics, prosopography (Rome), papyrology (Early Christianity), and editing and translation (Late Antiquity and Silk Road).

## Animal Behaviour

Our research combines insights from sensory, physiological and cognitive processes with genetic and comparative analyses. The goal of this uniquely integrative approach is to understand animal behaviour at all levels, from mechanism to evolution.

## Astronomy and Astrophysics

Macquarie University is a highly active centre of astronomical research excellence and is in close proximity to both the Anglo-Australian Observatory and the Australia Telescope National Facility. Our research strengths include wide-field astronomy, optical, infrared and radio studies of planetary nebulae and supernova remnants, stellar proper motions, theoretical studies of shock-waves, star formation and black holes.

## Biomolecular Frontiers

We undertake world-class research in proteomics, glycomics, genomics, biotechnology and chemical biology related to cell biology, human disease biomarker discovery, agri-food quality trait discovery, microbial physiology and pathogenicity, gene transfer systems, protein post-translational modifications and expression, and bioinformatics. The Biomolecular Frontiers team is underpinned by the state-of-the-art research infrastructure provided by the Australian Proteome Analysis Facility.

## Climate Risk

We are a multi-disciplinary group with expertise in climatology, water, coastal processes, geomorphology, ecology, economics, law and governance, social policy, planning and risk analysis. Our strategy is to use science and impact assessment infused by and packaged within a framework of economic, financial and legal risk.

## Cognitive Science

We study basic processes of cognition – language acquisition, reading and spelling, understanding and producing spoken language, face recognition, thinking, memory and attention – using our results to achieve greater understanding of cognitive disorders such as schizophrenia, autism, dyslexia, aphasia, specific language impairment in children and prosopagnosia.

## Earth and Planetary Evolution

By integrating information across traditional discipline boundaries including geochemistry, geophysics, geodynamics and tectonics, Macquarie is now a world leader in mapping the Earth in four dimensions. Our cutting-edge isotope, geochemical and experimental instrumentation and strong industry collaborations attract leading local and international geoscientists.

## Ecology and Evolution

Working under the slogan 'genes to geoscience', we are a coalition of research groups and individual researchers, who believe that exceptionally interesting and important science over coming decades will arise through bridging from molecular technologies and biological detail, up to world-scales in space and geology-scales in time.

## Emotional Health

We focus on understanding, treating and preventing emotional distress, as well as promoting positive emotional health. Research interests of team members focus on emotional difficulties across the lifespan. The team has developed novel interventions through its research clinic.

## Financial Risk

We focus on the financial implications of risk arising out of global capital market fluctuations, climate change, foreign exchange, longevity, retirement, and regulatory risk. Our key research agenda is to better understand, integrate, manage and price financial risk to allow their efficient and equitable distribution within our economic system.

## Language Sciences

We bring a combination of theoretical, experimental and computational approaches to the investigation of live issues in the production and comprehension of languages across the human life span. Central issues include how human language is processed in the brain, how language develops in normal children and the nature of language disorders in children and adults.

## Lasers and Photonics

In Macquarie University's Photonics Research Centre, our internationally-leading researchers pursue a broad range of experimental and theoretical studies in lasers, optics, photonics and optoelectronics. We aim to address fundamental questions and develop new optical technologies for applications such as medical diagnosis and therapy, high-resolution imaging and sensing, and microfabrication.

## Legal Governance

We research legal governance and regulatory problems facing governments, businesses, and communities, including global and national governance, environmental sustainability, corporate social responsibility, and the medico-legal challenges of human health.

## Neuroscience, Vascular Sciences and Surgery

We research the effects of the brain on cardiovascular and respiratory systems; as well as the effects of the cardiovascular system on the brain. Our research group includes leading scientists and clinicians, with a strong emphasis on the neurosciences; particularly how the central nervous system controls blood pressure and breathing, blood flow in large arteries and pathology of the cerebral vasculature.

## Quantum Information Science and Security

With experts in optics, condensed matter physics, theoretical physics, computer science, statistics and chemistry, we forge discoveries in quantum science and technology. Quantum information science drives a wide range of new technologies such as quantum computers, quantum materials, quantum cryptography, quantum simulations and quantum algorithms. The addition of experimental expertise opens new routes for interdisciplinary research.

## Social, Cultural and Political Change

We are a cross-disciplinary group with expertise in the history of media, culture and politics. We focus on the history of the press, radio and film; the representations of history in various media; feminist and postcolonial studies; culturally constructed notions of gender and sexuality; literary history and critical theory; and historically informed accounts of political culture, citizenship and public opinion.

## Social Inclusion

At the Centre for Research on Social Inclusion, our scholars engage in philosophical, social and cultural inquiry and collaborate in interdisciplinary research on key issues such as work reform, globalisation, cities, migration, multiculturalism, racism and welfare. A distinctive feature of the Centre is its commitment to research that is both socially relevant and theoretically innovative.

## Wireless Communications

We undertake complementary research activities related to wireless communications, ranging from transistor circuits for radio, to telecommunications networking and transmission via optical and radio propagation. The specialist expertise within the team provides a niche capability in the understanding of the interplay between components in telecommunications systems.

For more information about Macquarie's COREs, visit

[www.research.mq.edu.au/about/research\\_@\\_macquarie](http://www.research.mq.edu.au/about/research_@_macquarie)

## Further areas of study

In addition to these COREs, individual academics in all faculties can supervise students whose interests fall outside these areas.

### Faculty of Arts

Ancient History; Anthropology; English; Indigenous Studies; International Studies; Law; Media, Music and Cultural Studies; Modern History, Politics and International Relations; Philosophy; Sociology; Policing and Intelligence

### Faculty of Business and Economics

Accounting and Finance; Actuarial Studies; Applied Finance; Business; Business Law; Economics; Macquarie Graduate School of Management (MGSM)

### Faculty of Human Sciences

Australian School of Advanced Medicine (ASAM); Early Childhood; Education; Human Cognition and Brain Science; Linguistics; Psychology;

### Faculty of Science

Biological Sciences; Brain Behaviour and Evolution; Chemistry and Biomolecular Sciences; Chiropractic; Computing; Earth and Planetary Sciences; Environment and Geography; Graduate School of Environment; Mathematics; Physics and Engineering; Statistics

## Australian Hearing Hub

To be completed in 2012, the Australian Hearing Hub will be a unique, world-class facility purpose-designed to facilitate the advancement of our understanding of hearing and related speech and language disorders. The Hearing Hub will enable advances in mapping brain/hearing functions, understanding of auditory processing, assessing auditory system disorders, developing hearing aid and implant technologies and improving strategies for rehabilitation and learning to hear.

Located on the campus of Macquarie University, it will bring together the University's internationally leading research teams in Language Sciences and Cognitive Sciences, as well as clinical research/professional training teams in Audiology and Speech Language Pathology.

The Hearing Hub will host Australian Hearing Services, a major Australian Government research organisation, and its National Acoustics Laboratory, as well as research specialists from Cochlear Limited, Australia's leading hearing technology company. Joining us also will be a number of prominent not for profit organisations, including the Royal Institute for Deaf and Blind Children, the Sydney Cochlear Implant Centre and The Shepherd Centre.

Together with Cochlear Global Headquarters, also to be located on campus at Macquarie University, the Hearing Hub will help to make Macquarie University a true leader globally for research and education in hearing and speech related disorders.



IMAGE: PERUMAL PEDAVOLI

## Doctor of Philosophy (PhD) at a glance

Entry into the Macquarie PhD program is competitive. Full details of entry criteria can be found at

[www.hdr.mq.edu.au](http://www.hdr.mq.edu.au)

### Admission Requirements

- Bachelor Honours (Class 2 Division 1 minimum); or
- Master by Coursework (25 per cent research, credit minimum); or
- Master by Research (credit minimum); or
- Equivalent Research Experience (eg. Research papers); or
- Bachelor or Master by Coursework degree, with no research component plus either a Postgraduate Certificate\* (100 per cent research and credit minimum); or
- Postgraduate Diploma\* (50 per cent research, credit minimum)

### plus

- English language proficiency (IELTS minimum 6.5, or 7 for scholarship applicants)
- Research proposal
- Referee reports if applying for a scholarship

\* These 'pathway' programs are coursework programs which may not be available in all departments. Students should seek advice with their Faculty/Department academic advisors before applying.

### Application and commencement

You can apply and commence at any time. To apply for a PhD at Macquarie University, email [hdrfuture@mq.edu.au](mailto:hdrfuture@mq.edu.au) or visit [www.hdr.mq.edu.au](http://www.hdr.mq.edu.au)

### Coursework

If required, normally less than one semester (full time), based on individual needs.

### Duration

Normally 3.5 years

### Annual Fees +

Approximately AU\$21,000 - \$28,000 for international students

### Scholarships

Very competitive, eligible candidates will receive a full tuition fee scholarship and a living allowance of AU\$22,500 per year. For scholarship requirements see:

[www.hdr.mq.edu.au/information\\_about/scholarships](http://www.hdr.mq.edu.au/information_about/scholarships)

### Supervision

At least two academics and a chief supervisor who will be a full-time permanent faculty member.

### Thesis

- Maximum word count varies (usually less than 90,000)
- Preference for published papers to be included.
- Generally in English, other languages subject to approval.

### Thesis examination

Three external, independent examiners' reports reviewed by a university central committee. No oral defence required.

For CRICOS codes and further details on entry requirements, please view the *Higher Degree Research Prospectus* available for download at

[www.international.mq.edu.au/research/phd](http://www.international.mq.edu.au/research/phd)

+ Unless otherwise specified, all international students are required to pay tuition fees. New students are advised of the required tuition fees to be paid in their letter offering candidature. Tuition fees for all commencing students are indexed annually. For further details visit

[www.hdr.mq.edu.au/information\\_about/research\\_degrees/fees](http://www.hdr.mq.edu.au/information_about/research_degrees/fees)



## Cotutelle/Joint PhD - Gain double recognition!

In addition to the usual direct entry PhD, Macquarie University encourages Cotutelle and Joint PhD enrolment with research active overseas universities.

Simultaneous enrolment at Macquarie University and one of our partner universities will enable students to submit one thesis for joint recognition. About half of the student's time will be spent at each university and travel funds are provided. Students will be supervised by researchers at the two universities and meet all the requirements to graduate at both of them. Cotutelle students graduate with two separate degrees, one from each university, while students who enter into Joint PhD programs graduate with a single degree which is jointly conferred. Such programs are open to both domestic and international PhD candidates.

Eligible Cotutelle or Joint PhD students are entitled to the MQRES (Macquarie University Research Excellence Scholarship) which provides full tuition payment and a living allowance/stipend of AU\$22,500 per year while studying at Macquarie University. Additional travel fund fees between the two countries will also be provided. The following are some examples of our existing Cotutelle and Joint PhD agreements:

Partner University	Degree enrolled at Macquarie
Tsinghua University, China	Cotutelle PhD-Physics
University of Amsterdam, Netherlands	Cotutelle PhD-Psychology
University of Frankfurt, Germany	Cotutelle PhD-International Studies
University of Glasgow, UK	Joint PhD-Media, Music and Cultural Studies
University of Goettingen, Germany	Cotutelle PhD-Management
University of Paris-Sud 11, France	Cotutelle PhD-Environment and Geography
University of Vienna, Austria	Cotutelle PhD-Modern History, Politics and International Relations

To view a list of our partner universities participating in Cotutelle and Joint PhD programs visit

[www.international.mq.edu.au/research/partner](http://www.international.mq.edu.au/research/partner)

Because of the nature of these programs, a legally-binding Joint PhD Supervision Agreement between the two universities is required before a student commences his/her joint enrolment. A sample agreement can be found at

[www.international.mq.edu.au/research/cotutelles](http://www.international.mq.edu.au/research/cotutelles)

### Contact Us

The HDR Marketing and Development Team at Macquarie International (MI HDR) facilitates all matters related to joint PhD supervision agreements. To contact the MI HDR team, email [MI\\_HDR@mq.edu.au](mailto:MI_HDR@mq.edu.au).

*Disclaimer: Information given in this publication is correct at the time of printing (April 2010) but is subject to change without notice. The University has the right to alter the content or impose terms and conditions in relation to a program at any time.*



### GETTING THE BEST OF BOTH WORLDS

Many of our Cotutelle and Joint PhD partners are world leaders in their field. One recent example is the Cotutelle agreement between the Faculty of Economics and Business Administration at Goethe University Frankfurt and Macquarie University's Faculty of Business and Economics. Located in Frankfurt, Germany's financial centre and home of the European Central Bank, Goethe University Frankfurt is a perfect partner for Macquarie University's Financial Risk CORE.

For Katja Ignatieva (Cotutelle PhD in Economics, pictured), our third Cotutelle PhD from Goethe University Frankfurt, it all happened naturally. "I started my PhD 1.5 years ago at the Goethe University Frankfurt, Germany. During the first year of my studies I met my Macquarie University supervisor Associate Professor Stefan Trueck in Melbourne when I was participating in a finance workshop. He motivated me to come and study in Australia as a Cotutelle student, and to work with him in the area of finance I was interested in myself." says Katja.

*"This is an excellent experience which allows me not only to obtain a dual award from both universities, but also to get to know the country, and a chance to work with researchers from both countries in the future."*