

## Macquarie University, Sydney, Australia

# RESEARCH OPPORTUNITIES

Macquarie University is committed to being a leader in research. We are recruiting 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 Rankings, 2008), Macquarie University is a research-intensive university. Our goal is to open students' minds to the challenges of research and to life-long enquiry.

Macquarie's international reputation rests on distinct research areas of the highest quality. We are expanding this through our unique concentration and research recruitment strategy which will add about 100 highly performing researchers to our staff by the end of 2009.

Macquarie University has invested in a unique plan to secure our position as a world-class research institution in areas of international significance and benefit to Australia.

## Further areas of study

In addition to the COREs outlined overleaf, academics in all Faculties can supervise students whose interests fall outside these areas.

### Faculty of Arts

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

### Faculty of Business & Economics

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

### Faculty of Human Sciences

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

### Faculty of Sciences

Biological Sciences; Brain Behaviour & Evolution; Chemistry & Biomolecular Sciences; Chiropractic; Computing; Environment & Geography; Mathematics; Physics & Engineering; Statistics

## Recent research highlights

- Eighteen Concentrations of Research Excellence (COREs) have been established (see overleaf for further details) to attract major external funding while building international profiles.
- International PhD applications are accepted all year round, allowing greater flexibility for potential applicants.
- The Macquarie Research Excellence Scholarship (MQRES) budget was increased to AU\$16.3 million in 2009.
- The University 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.
- Macquarie's research capacity will soon be enhanced by major infrastructure developments, including the AU\$180 million Macquarie University Hospital (pictured below) and the AU\$140 million Hearing Hub.



## Contact us

For application enquiries, contact the Macquarie University Higher Degree Research Office:

Email: [hdrfuture@mq.edu.au](mailto:hdrfuture@mq.edu.au)  
Web: [www.research.mq.edu.au](http://www.research.mq.edu.au)

For enquiries or assistance in finding a supervisor, contact the Macquarie International HDR team:

Email: [mi\\_hdr@mq.edu.au](mailto:mi_hdr@mq.edu.au)  
Web: [www.international.mq.edu.au/research](http://www.international.mq.edu.au/research)

# Concentrations of Research Excellence (COREs)

Macquarie'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 & 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 radios, 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/excellence](http://www.research.mq.edu.au/excellence)