



Photo: Bernie Phelan

World-leading research at Macquarie University, Sydney

From the Deputy Vice-Chancellor: Research



Photo: Michelle Wilson

Macquarie prides itself on its international research reputation. As one of Australia's premier teaching and research institutions, we are confident that your choice of Macquarie University for your research degree program will be rewarded by an exceptional experience of research training in an environment of the highest quality.

Over recent years Macquarie's performance has been exceptional: increasing its research outputs to rank amongst the top three Australian universities in refereed publications per academic staff member, and first in citation rankings in environmental science and ecology. The University also achieved outstanding results in terms of competitive research grants for two new national Centres of Excellence.

The recent Excellence in Research for Australia initiative ranked us fourth in Australia on the proportion of our research judged at the highest possible level. Our research performance was rated as 'outstanding and well above world standard' in biological, Earth, environmental and physical sciences, as well as in cognitive sciences and psychology. Overall, 80 per cent of Macquarie's research activity was rated as performing at world standard or higher.

I welcome your interest in undertaking a research degree program at Macquarie University. I urge you to contact our staff to investigate the opportunities available for you to gain an advanced research degree of the highest international standing.

Professor Jim Piper
Deputy Vice-Chancellor: Research,
Macquarie University

About ERA

Excellence in Research for Australia (ERA) is a research quality evaluation program for all 41 Australian universities, introduced by the Australian Government through the Australian Research Council. The first ERA evaluation was conducted in 2010 with results announced in January 2011.

Inside this brochure we list the major research areas in which we received ERA rankings of 5 (indicating 'well above world standard') and 4 (indicating 'above world standard') and their allied research centres and groups.

For more information on ERA and our top research areas visit www.mq.edu.au/research/era.



5-rated disciplines

Five major discipline areas received a top 5 rating – the highest possible rating in ERA 2010, indicating performance well above world standard.

Biological sciences

Within biological sciences, research is chiefly focused around ecology and evolution, and biomolecular sciences. Ecology and evolution has its focus in plant ecological strategies, biodiversity and conservation, climate change, coastal processes, conservation genetics, microbial genomics, evolutionary animal behaviour, and planning and risk analysis. Biomolecular sciences has strengths in genomics, proteomics, glycomics, bioinformatics and biotechnology, and their application to health, environmental and industrial issues.

Earth sciences

Earth and planetary sciences (EPS) research at Macquarie is based predominantly within the Australian Research Council (ARC) National Key Centre for Geochemical Evolution and Metallogeny of Continents (GEMOC), which has now evolved into the new ARC Centre of Excellence for Core to Crust Fluid Systems. Led by Professor Sue O'Reilly, the Centre will deliver a new framework for mineral exploration, linking ore deposits to tectonics, mantle structure and the transport of material and energy. It will also integrate previously disparate fields – geochemistry, petrophysics, geophysics, and numerical and thermodynamical modelling – to reach a new level of understanding of Earth's dynamics and the fluid cycle(s) through time.

Environmental sciences

The areas of research excellence at Macquarie that contribute to environmental sciences are Climate Risk, and Ecology and Evolution. These areas are strongly supported by the University's research strengths found in Genes to Geoscience, the ARC Centre of Excellence for Core to Crust Fluid systems, Risk Frontiers, and our participation in the National Climate Change Adaptation Research Facility.

A major emphasis of research in the area of ecological applications is engagement with government, industry and the community, resulting in important applications in policy input and development. Macquarie has built on its long established base of research on climate change and its social and environmental impacts, to significantly expand climate-related research through a strategic alliance with biologists, social scientists, economists and others through the establishment of the Climate Futures Research Centre.

Physical sciences

Based predominantly within the Department of Physics and Astronomy, research in physical sciences at Macquarie has a strong focus on experimental and applied physics, while also concentrating on more fundamental and theoretical studies of atomic, optical and quantum physics, and astrophysics.

Three research centres are hosted within physical sciences – Astronomy and Astrophysics, Lasers and Photonics, and Quantum Information Science and Security. Macquarie is a major node in two ARC Centres of Excellence – the Centre for Ultrahighbandwidth Devices for Optical Systems (CUDOS) and the Australian Centre of Excellence for Quantum Computation and Communication Technology (CQCT). Other research facilities include the ARC Australian Research Network for Fluorescence Applications in Biotechnology and Life Sciences (FABLS), the CSIRO Australia Telescope National Facility, and the Anglo-Australian Observatory.

Psychology and cognitive sciences

Research in psychology and cognitive science is conducted mainly within the Department of Psychology and the Macquarie Centre for Cognitive Science (MACCS). However, there are numerous collaborations with researchers in education, early childhood, linguistics, brain, behaviour and evolution, statistics, computing, sociology, philosophy and business. MACCS, established as an ARC Special Research Centre in 2000, has now evolved into the ARC Centre of Excellence in Cognition and its Disorders.

The Centre for Emotional Health is leading the world in understanding and treating anxiety, depression and related mental health problems. The Centre for the Integrative Study of Animal Behaviour hosts researchers with international reputations in the field of comparative cognition. Our success in this area is due also to the contributions of many other outstanding researchers who play important roles in the Developmental Disorders of Language and Literacy Network, a network of researchers and clinicians investigating and treating language disorders.



4-rated disciplines

Three major disciplines received a rating of 4 in ERA 2010, indicating performance above world standard.

History and archaeology

Research is predominantly undertaken within the disciplines of modern and ancient history. In ancient history, research is concentrated in the Macquarie University Ancient Cultures Research Centre, and is distinguished by strengths in Manichaean Studies, Late Antiquity, and Early Christianity. Australia's most prominent centre of Egyptology conducts archaeological work at five sites in Egypt, which provide data for research on Egypt from the early Dynastic to Coptic periods. The Centre also provides world-class research infrastructure including digital and photographic archives of Egyptian wall art gathered on site, and of Greek and Coptic papyri; and specialist libraries for Egyptology, Manichaean studies and Graeco-Roman documentary research.



Photo: Effy Alexakis, PHOTOWRITE

In modern history, a cross-disciplinary group with expertise in the history of culture, gender, media and politics forms a CORE – Social, Cultural and Political Change. We are also recognised internationally as the progenitor of 'Big History', an original interdisciplinary approach to world history developed by Professor David Christian, that draws upon research in cognate fields and sciences.

Electrical and electronic engineering

Electrical and electronic engineering at Macquarie specialises in microwave and wireless communications, and is based predominantly within the Department of Electronic Engineering.

Macquarie's CORE in this area – Wireless Communications – is supported by five research groups: the electromagnetic and antenna group, which has strong links with the CSIRO and works in the areas of smart materials and propagation; the nonlinear electronics group, which enjoys several external partnerships and has built up a world-class facility for test and measurement; the integrated wireless communication systems group, which has capitalised on the laboratory infrastructure; the nonlinear optics group, which closely collaborates with the MQ Photonics Research Centre; and the wireless body area networks group, which is undertaking research into medical applications.

Linguistics

Linguistics research is conducted across a number of disciplines and centres including linguistics, media, cultural studies, English, European and Asian Languages, computer science and the Macquarie Centre for Cognitive Science – an ARC Special Research Centre. The CORE in Language Sciences adds further value to these areas. Research within the Centre for Language Sciences was significantly enhanced with the establishment of the ARC Centre of Excellence in Cognition and its Disorders, led by Federation Fellow and Distinguished Macquarie University Professor, Dr Stephen Crain, in 2011.

Major areas of research strength are in applied and educational linguistics, sign language, and systemic functional grammar. Macquarie University received a \$40 million grant for the Australian Hearing Hub, which will bring together researchers in hearing, speech and language with Cochlear Ltd, Australian Hearing, the Royal Institute of Deaf and Blind Children, the Shepherd Centre and the Sydney Cochlear Implant Centre.

National and University Research Centres

Discipline area(s)	Research centre / network	Website
	■ Macquarie University research centre ■ National research centre	
Applied ethics	■ Centre for Agency, Values and Ethics	http://cave.mq.edu.au
Biological sciences	■ Australian Proteome Analysis Facility	www.proteome.org.au
	■ Biomolecular Frontiers Research Centre	www.chem.mq.edu.au/biomolecular_frontiers
	■ Centre for the Integrative Study of Animal Behaviour	www.bio.mq.edu.au/dept/centres/cisab
Biological sciences, environmental sciences	■ Genes to Geoscience	www.gg.mq.edu.au
	■ Climate Futures	www.climatecore.mq.edu.au
	■ National Climate Change Adaptation Research Facility	www.nccarf.edu.au
Biological sciences, psychology and cognitive sciences	■ Macquarie Centre for Cognitive Science	www.maccs.mq.edu.au
Business and economics	■ Capital Markets Cooperative Research Centre	www.cmcr.com
Computation theory and mathematics	■ Centre of Australian Category Theory	http://web.science.mq.edu.au/groups/coact
Earth sciences, environmental sciences	■ ARC Centre of Excellence for Core to Crust Fluid Systems	www.ccfs.mq.edu.au
Environmental sciences	■ Environmental Biotechnology Cooperative Research Centre	www.ebcrc.com.au
History and archeology	■ Ancient Cultures Research Centre	www.acrc.mq.edu.au
Law	■ Centre for Legal Governance	www.clg.mq.edu.au
Physical sciences	■ ARC Centre of Excellence for Engineered Quantum Systems	www.arc.gov.au/ncgp/ce/engineered_quantum_systems.htm
	■ ARC Centre of Excellence for Ultrahigh Bandwidth Devices for Optical Systems	http://web.science.mq.edu.au/groups/cudos
	■ Macquarie BioFocus	
	■ OptoFab Australian National Fabrication Facility	www.anff.org.au
	■ Macquarie Photonics	http://web.science.mq.edu.au/groups/mqphotonics
	■ Centre in Astronomy, Astrophysics and Astrophotonics	www.physics.mq.edu.au/astronomy
	■ Research Centre in Quantum Science and Technology (QSciTech)	www.qscitech.info
Psychology and cognitive sciences	■ Centre for Emotional Health	www.ceh.mq.edu.au
	■ Children and Families Research Centre	www.iec.mq.edu.au/research/cfrc
Psychology and cognitive sciences, linguistics	■ Centre for Language Sciences	www.ling.mq.edu.au/clas
	■ ARC Centre of Excellence in Cognition and its Disorders	www.ccd.edu.au
	■ Hearing Cooperative Research Centre	www.hearingcrc.org
Sociology	■ Centre for Research on Social Inclusion	www.crsi.mq.edu.au
Specialist studies in education	■ Macquarie University Special Education Centre (MUSEC)	www.musec.mq.edu.au

We offer a comprehensive range of research opportunities in all disciplines we teach.

There are individual academics in all of our departments below available to supervise students whose interests fall outside the above-mentioned areas. The Macquarie University Supervisor Register (MQSR) <http://mqsr.mq.edu.au/MQSR> is a comprehensive online listing of Macquarie PhD supervisors with their research interests and contact details.

Faculty of Arts

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

Faculty of Business and Economics

Accounting and Corporate Governance; Applied Finance and Actuarial Studies; Economics; Marketing and Management

Macquarie Graduate School of Management

Faculty of Human Sciences

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

Faculty of Science

Biological Sciences; Chemistry and Biomolecular Sciences; Chiropractic; Computing; Earth and Planetary Sciences; Electronic Engineering; Environment and Geography; Mathematics; Physics and Astronomy; Statistics



Photo: Effy Alexakis

There has never been a better time to do a PhD at Macquarie University.

Macquarie greatly appreciates the contribution of our PhD candidates to our research culture and research performance. Each year, we recruit around 400 outstanding new PhD candidates from Australia and around the world to the University. Among them, close to 35 per cent are international candidates. The majority of our these PhD candidates receive generous scholarships to cover their tuition payment and living stipend, allowing them to remain focused on their study and complete on time.

In addition to scholarships, we offer specialised support to PhD candidates at University, faculty and department levels. The Postgraduate Research Fund provides funding for research-related travel; our faculties offer regular study skills seminars, additional funding for research materials and equipment, and dedicated desks and lab spaces for PhD candidates.

Over the last few years, Macquarie University has invested nearly a billion dollars in infrastructure including a private teaching and research hospital, a state-of-the-art library with dedicated study areas for higher degree research candidates, a new medical centre attached to the Australian School of Advanced Medicine, Cochlear Global Headquarters, the Australian Hearing Hub, modern science labs and a new health and fitness centre.

Located in Sydney, Australia's largest city, Macquarie University is set on 126 hectares of park-like campus. The campus is next to a major shopping centre and one of the largest business centres in Sydney. A train station on campus offers a direct 30 minute train link to the city, with its world-famous sights such as the Sydney Opera House and Harbour Bridge.

Our international students come from over 110 countries. They enjoy a friendly, dynamic and multi-cultural campus experience, with many joining various student clubs and other social groups.

Fees and scholarships

Our PhD tuition ranges from around \$25,000 to \$30,000 per year and the standard Macquarie University Research Excellence Scholarship includes tuition payment and around \$22,680 per year (as of 2011) in living stipend for up to 3.5 years.

A large portion of our domestic and international PhD candidates receive various government and industry scholarships. For some scholarship recipients (for example, those receiving the China Scholarship Council (CSC) Scholarship), Macquarie provides a tuition scholarship and a top-up scholarship to the living stipend they receive.

How to apply

We strongly encourage all prospective candidates to make contact with prospective supervisors before applying. All departments in the four faculties offer PhD programs. A list of PhD supervisors in each department can be found within the Macquarie University Supervisor Registry: <http://mqsr.mq.edu.au/MQSR>.

The Higher Degree Research Office at Macquarie University manages all application and scholarship enquiries. Their website has information about entry criteria, application procedure and a list of current scholarships and their deadlines.

www.hdr.mq.edu.au or email hdrfuture@mq.edu.au

