Macquarie’s research in mathematics and statistics is of an international calibre. In the most recent Excellence in Research for Australia (ERA) evaluation, our research in the sub-discipline of computation theory and mathematics received a rating of ‘performance above world standard’ and our research in the sub-discipline of pure mathematics received a rating of ‘performance at world standard’.

Mathematical sciences research at Macquarie is undertaken in pure and applied mathematics, with strengths in applied mathematics, category theory, harmonic analysis and number theory, and statistics, with strengths in biostatistics, epidemiology and medical statistics, image processing, stochastic finance and time series analysis.


Collaborative research is also significant, with partners including national medical research institutes such as the NHMRC Clinical Trials Centre and George Institute for Global Health, and Defence Science and Technology Organisation, Australian Signals Directorate and IBM.

As an HDR candidate you will have the opportunity to research alongside some of the best academics and researchers not just in Australia but the world.

AREAS OF SPECIALISATION
- Analysis
- Applied mathematics
- Biostatistics
- Category theory
- Computational statistics
- Number theory
- Signal and image processing
- Statistics education

FACILITIES
- Macquarie runs a small supercomputer based on Nvidia Tesla boards

RESEARCH HUBS
- Centre of Australian Category Theory
Highlights

- Macquarie is home to an ARC Australian Professorial Fellow, a Fellow of the Australian Academy of Science, and an Australian Mathematical Society Medallist

- Several researchers sit on the editorial boards of leading journals such as Advances in Mathematics; Australian & New Zealand Journal of Statistics; Designs, Codes and Cryptography; IEEE Transactions on Antennas and Propagation; Journal of Global Optimization; Journal of Time Series Analysis; Mathematics of Computation; SIAM Journal on Computing; Statistical Methods in Medical Research and Statistics in Medicine

Research leaders

Macquarie is home to many internationally renowned researchers, including:

Professor Ian Marschner is one of Australia’s leading biostatisticians. He has made many contributions to the development of new methodology for the design and analysis of health research studies, and has strong collaborations with medical researchers, particularly at the NHMRC Clinical Trials Centre. He has extensive research and development experience in the pharmaceutical industry.

Professor Barry Quinn works across the boundaries of statistics and electrical engineering, specifically in time series problems in signal processing. He has held chairs at the Universities of London and Manchester, and is an associate editor of the Journal of Time Series Analysis.

Professor Paul Smith works in applied analysis, specifically modelling of wave phenomena and related areas in differential and integral equations. He works closely with industry on areas including antenna design, transient electromagnetics and radar cross-section.

Associate Professor Steve Lack has a particular interest in enriched and higher category theory. He was the Australian Mathematical Society Medallist in 2009, is a Fellow of the Society, and sits on the editorial boards of Theory and Applications of Categories, Applied Categorical Structures, and Mathematical Structures in Computer Science.

Support

We give HDR candidates strong academic and administrative support. This includes:

- commencement and completion programs
- discipline-specific research training units, including workshops in research communication, presentation skills, academic writing skills, thesis planning and poster preparation
- experienced supervisors and department-based higher degree research directors
- financial support for research project costs, including top-up scholarships from industry
- regular progress reports and interviews, and/or work-in-progress presentations in which research candidates receive feedback on their work from a panel of academics in their field.