

## Media Release

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### Big data comes down to earth as NICTA launches \$12M natural sciences project

*Scientists from NICTA, SIRCA, Macquarie University and The University of Sydney join forces to deliver data-led insights to ecology, physics and geosciences.*

NICTA, Australia's Information and Communications Technology (ICT) Research Centre of Excellence, is leading a ground-breaking, multi-million-dollar project that will use 'big data' and machine learning to deliver new insights to the natural sciences. This \$12M, three-year research endeavour will advance fundamental mathematics and statistics to provide a framework, methodologies and tools for data-enabled scientific insight and discovery. It is supported by \$4M from the Science and Industry Endowment Fund ([SIEF](#)) and \$8M from the research collaborators over the life of the three-year project.

Professor Ian Chubb, Chief Scientist of Australia, said: "This project positions Australia to one day be home to a new generation of big data analytics tools that could be used by all manner of scientists around the world to advance knowledge discovery."

The rich biodiversity seen throughout the world is the result of many interacting ecological processes. A multi-disciplinary team from NICTA, SIRCA, Macquarie University and The University of Sydney, will use data science to determine which of these interactions are most important in producing the world we see around us, potentially opening a window on some of the mysteries of biodiversity and showing how ecosystems will be affected by climate change and other factors.

The project will also combine publicly available geological data from Geosciences Australia with SIRCA technology that helps predict stockmarket movements, to help picture what Australia was like 1.5 billion years ago, and how its rich metal deposits were formed. Work in complex laser systems will help improve the security of optical fibre communication systems. The research will help discover sophisticated data analysis processes that can reduce the amount of raw data needed to conduct successful experiments, potentially hastening the rate of scientific progress.

Speaking at the official launch of the knowledge discovery project at SIRCA's headquarters in Sydney this evening, Professor Hugh Durrant-Whyte, CEO, NICTA, said: "This project will explore a new and powerful paradigm for data intensive science – not just in the domains we're talking about tonight, but to many others ranging from medical and health sciences, to physics."

"Data and the right software can be very powerful catalysts for both breakthrough research and innovation. In Chicago in financial services, the availability of the right data and tools led to a revolution in that discipline in the 1970s leading to 25 Nobel Prizes in Economics being awarded to scholars associated with the University of Chicago 1970-2010," said Dr Michael Briers, CEO, SIRCA Limited.

The project brings together some of the best computer and data scientists in the world from NICTA (machine learning and analytics) with software engineers from SIRCA (software and big data) together with three of Australia's most distinguished natural scientists in physics, plant science and geosciences, to tackle grand scientific challenges in completely new ways:

- Terrestrial Ecology led by Professor Mark Westoby at Macquarie University
- Physics and Mathematics of Complex Laser Systems led by Professor Deb Kane at Macquarie University and
- Geosciences, Earth dynamics and tectonics led by Professor Dietmar Muller from The University of Sydney.

#### **About NICTA**

NICTA (National ICT Australia Ltd) is Australia's Information and Communications Technology Research Centre of Excellence. NICTA develops technologies that generate economic, social and environmental benefits for Australia. NICTA collaborates with industry on joint projects, creates new companies, and provides new talent to the ICT sector through a NICTA-enhanced PhD program. With five laboratories around Australia and over 700 people, NICTA is the largest organisation in Australia dedicated to ICT research. NICTA is funded by the Australian Government through the Department of Broadband, Communications and the Digital Economy and the Australian Research Council through the ICT Centre of Excellence Program. NICTA is also funded and supported by the Australian Capital Territory, the New South Wales, Queensland and Victorian Governments, the Australian National University, the University of New South Wales, the University of Melbourne, the University of Queensland, the University of Sydney, Griffith University, Queensland University of Technology and Monash University.

#### **About SIRCA**

Sirca is a provider of online services to support finance and other data-intensive research at universities, Government and financial market participants world-wide. Established in 1997, SIRCA has grown to employ over 80 staff and serve customers around the world. SIRCA technology is used extensively in the financial services industry worldwide by over 400 leading commercial banks, central banks and regulators. SIRCA technology underpins the world's leading algorithmic back-testing solution – Thomson Reuters Tick History. SIRCA technology, in partnership with Australian Securities Exchange (ASX) also powers the leading research database of historic financial markets data in Australia: AusEquities.

#### **About The University of Sydney**

The University of Sydney is a public Australian university that is located in Sydney, New South Wales. The main campus spreads across the suburbs of Camperdown and Darlington on the southwestern outskirts of the Sydney CBD. Founded in 1850, it is the oldest university in Australia. The University of Sydney is organised into sixteen faculties and schools, through which it offers bachelor's degrees, master's degrees and doctoral degrees. Three Nobel laureates have been affiliated with the university as graduates and faculty. Sydney consistently ranks amongst the top universities in Australia, Oceania and the world.

#### **About Macquarie University**

Macquarie University is an Australian public teaching and research university located in Macquarie Park, New South Wales. Founded in 1964 by the New South Wales Government, it was the third university to be established in the metropolitan area of Sydney. In May 2012 international ranking agency QS released its list of the Top 50 universities in the world under the age of 50. Macquarie University came in at number one, ranking higher than any other Australian universities. At a global level, Macquarie is ranked 16.

#### **About SIEF**

Spanning a history of over 80 years, the Science and Industry Endowment Fund (SIEF) provides grants to science and scientists for the purposes of assisting Australian industry, furthering the interests of the Australian community and contributing to the achievement of Australian national objectives. In 2009, this unique and esteemed funding arrangement received a substantial gift from CSIRO facilitating the rejuvenated Fund to be a mechanism for significant support of science in Australia. Providing some of the largest grants available across the National Innovation System, as of Dec 2011 the Fund is currently supporting 12 Research Projects to the value of AU\$70 million, as well as a commitment of some \$11M over the next 7 years for Promotion of Science in the form of Scholarships, Fellowships and a Chair in Wireless communication at Macquarie University.'

SCIENCE AND  
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For further information:

Dorothy Kennedy  
Communications Specialist, NICTA  
Ph: 02 9376 2098 or 0488 229 687  
[dorothy.kennedy@nicta.com.au](mailto:dorothy.kennedy@nicta.com.au)  
[www.nicta.com.au](http://www.nicta.com.au)

Paul McCarthy  
Director, Strategy and Innovation, SIRCA  
Ph: 02 8355 2541 or 0418 608 224  
[paul.mccarthy@sirca.org.au](mailto:paul.mccarthy@sirca.org.au)