

Summary of Linkage Infrastructure, Equipment and Facilities Proposals by State and Organisation

New South Wales

The University of New South Wales

LE100100128 Prof Rose Amal, Dr Kondo-Francois Aguey-Zinsou, Prof Cameron J Kepert, Prof Hua Kun Liu, Dr Cordelia Selomulya, Dr Jason A Scott, Dr Wey Yang Teoh, Dr May T Lim, Dr Christoph H Arns, A/Prof Sammy L Chan, Reader Huanting Wang

Approved Project Title High performance analytical tools to strengthen clean energy research

2010 \$300,000.00

Primary FoR 0303 MACROMOLECULAR AND MATERIALS CHEMISTRY

Partner/Collaborating Organisation(s)

Monash University, The University of Sydney, University of Wollongong

Administering Organisation The University of New South Wales

Project Summary

High performance analytical tools are vital to the success of emerging research fields of national priority. By filling a gap in materials routine characterisation capabilities, the equipment requested will lead to major advances in fundamental and applied research aimed at carbon abatement and clean energy technologies. This includes technologies for clean energy generation by solar means and from decarbonised fossil fuels, efficient energy storage systems, advanced fuel cells for electricity generation, and hydrogen as the universal energy vector. Advancement of these technologies will bring solutions to the grand challenges facing Australia and in turn benefit industry and society.

LE100100089 A/Prof Katharina Gaus, Prof Levon M Khachigian, Prof Wendy Jessup, Prof Philip J Hogg, Prof Peter W Gunning, A/Prof Maria Kavallaris, Prof Mark D Willcox, Prof John J Gooding, Dr Pall Thordarson, Prof Nicholas J King, Prof David G Allen, Prof Mathew A Vadas, A/Prof Alaina J Ammit, Dr Thomas Grewal, Prof Katrina A Jolliffe, A/Prof Ann K Goodchild, Prof Helena K Nevalainen, A/Prof Cynthia B Whitchurch, A/Prof Elizabeth J Harry, Dr Anya Salih

Approved Project Title Super-resolution fluorescence microscopy

2010 \$700,000.00

Primary FoR 0601 BIOCHEMISTRY AND CELL BIOLOGY

Partner/Collaborating Organisation(s)

Macquarie University, The University of Sydney, University of Technology, Sydney, University of Western Sydney

Administering Organisation The University of New South Wales

Project Summary

The prestigious journal Nature Methods named super-resolution fluorescent microscopy as the Method of the Year 2008. This recognition is justified because fluorescent imaging on the molecular scale will revolutionise biological sciences. It will literally change the way we see the smallest building blocks of life and this allows researchers to identify the function of proteins and lipids in health and disease. This breakthrough technology is currently not available to researchers in Australia. Super-resolution fluorescence microscopy would extend Australia's leading position in the fundamental biological sciences, bio- and nano-technologies as well as imaging and microscopy.

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LE100100239 Prof Graham W Greenleaf, Prof Carolyn Sappideen, Prof Andrew S Mowbray, Prof Michael D Coper, Dr David Rolph, Mr John E Selby, Ms Patricia J Blazey, A/Prof Simone E Degeling

Approved Project Title **Free access legal research infrastructure for the whole of the common law: Completing CommonLII**

2010 \$189,410.00

Primary FoR 0806 INFORMATION SYSTEMS

Partner/Collaborating Organisation(s)

Macquarie University, The Australian National University, The University of Sydney, University of Technology, Sydney, University of Western Sydney

Administering Organisation The University of New South Wales

Project Summary

All legal researchers in Australia, and any other common law jurisdictions, need access to case law from the whole of the common law world for their research to be complete. Australian society benefits from better academic and professional research on common law issues. CommonLII's database coverage of the whole common law world, and its free access citator tracking the interconnections between cases will transform the common law research capacities of all legal researchers. CommonLII will also provide Australian leadership in development of legal information systems in the Commonwealth and the common law world.

LE100100201 Prof Vivien J Johnson, A/Prof Joanna Mendelssohn, Mr Andrew M Wells, Prof Ross R Harley, A/Prof Leong K Chan, Prof Jill Bennett, Dr Catherine M De Lorenzo, Dr Judith O'Callaghan, Prof Roger H Benjamin, Prof Colin Rhodes, Dr Anita J Callaway, Dr Catriona D Moore, Dr Caroline W Jordan, Dr Pamela J Zeplin, Dr Catherine M Speck, Ms Fiona Salmon, Dr Juliette M Peers, Dr Ian A McLean, Dr Darren Jorgensen, Prof Jonathan H Holmes, A/Prof Andrew E McNamara

Approved Project Title **Design and art of Australia online, a transformation of the dictionary of Australian artists online**

2010 \$400,000.00

Primary FoR 1901 ART THEORY AND CRITICISM

Partner/Collaborating Organisation(s)

National Library of Australia, National Portrait Gallery, State Library of New South Wales
La Trobe University, Queensland University of Technology, RMIT University, The Flinders University of South Australia, The University of Adelaide, The University of Sydney, The University of Western Australia, University of South Australia, University of Tasmania

Administering Organisation The University of New South Wales

Project Summary

The Design & Art of Australia Online (DAAO) archive provides global exposure for Australian scholarship on art and design, along with tangible economic, social and cultural benefits toward the sustainability of cultural industries. The next generation of the DAAO will enable cultural policy to be informed by an expanded and growing collection of scholarly research. It contributes to national digital humanities infrastructure by collaboratively working toward efficient discovery of data and interoperative infrastructure. Moreover the DAAO has potential as an enabling technology for Australia's Indigenous visual arts and craft sector in meeting the challenges of unethical conduct, sustainability and further developing international markets.

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LE100100116 Dr Sean S Li, Prof Martin A Green, Dr Rongkun Zheng, Dr Maxim Avdeev, Prof Qipeng Guo, Prof Janusz Nowotny, Prof Charles C Sorrell, Dr Leigh R Sheppard, Dr Run Y Yang, Dr Dehong Yu, Prof Yong Zhao, Prof Chao Zhang, Dr Zai P Guo, A/Prof Andrew J Ruys, Prof Veena Sahajwalla

Approved Project Title **Facilities of thermophysical characterisations at nanometre scale for development of advanced materials, energy technologies and biomedical components**

2010 \$350,000.00

Primary FoR 1007 NANOTECHNOLOGY

Partner/Collaborating Organisation(s)

Australian Nuclear Science and Technology Organisation
Deakin University, The University of Sydney, University of Western Sydney, University of Wollongong

Administering Organisation The University of New South Wales

Project Summary

Australia's energy, mining, metallurgical, defence, pharmaceutical and biomedical industries are spearheading the advancement of technologies in the global competitive market. They are the engines of Australian economic strength. Future progress of these industries will be largely driven by advances in materials. The installation of the proposed facilities will add a new dimension to high-level research performance and significantly enhance the capability for characterisation of various forms of materials and biomedical components in Australia. The continual development of advanced materials and energy technology will potentially provide a sustainable means for meeting the increasing global challenge for the industries.

LE100100098 Prof Gang-Ding Peng, Prof John Canning, Prof Aibing B Yu, Prof Rose Amal, Prof Nasser Khalili, Dr Brant C Gibson, A/Prof Xiaosong Gan, Dr John L Holdsworth, A/Prof Stephen F Collins, A/Prof Jiangtao Xi, Dr Jayantha A Epaarachchi, Dr Jeffrey R Reimers, A/Prof Javid Atai, Dr Tony Khoury, Dr Andrew M Michie, Dr Mattias L Aslund, Dr Kevin Cook, A/Prof Jun Wang, Dr Jason A Scott, Prof Chee Y Kwok, A/Prof Rodica Ramer, Dr D Sen, A/Prof Jie Bao, Prof Maxwell J Crossley, Prof Graham E Town, Prof Gregory W Baxter

Approved Project Title **Advanced facility for next generation sustainable energy, biomedical & nano-imaging optical fibre technologies**

2010 \$600,000.00

Primary FoR 1007 NANOTECHNOLOGY

Partner/Collaborating Organisation(s)

Macquarie University, Swinburne University of Technology, The University of Melbourne, The University of Newcastle, The University of Sydney, University of Southern Queensland, University of Wollongong, Victoria University

Administering Organisation The University of New South Wales

Project Summary

Remote optical fibre technologies are the way forward for effective and safe monitoring of many industries, and will play a big part in the sustainability of Australia's core oil, gas and alternative energy sectors. They are equally important to health industry applications, particularly in medical and imaging technologies. This facility brings together world-class Australian expertise—from across nine universities—in advanced structured optical fibres, complex fibre diagnostic systems, nanoscale imaging, and environment monitoring, to design and implement the next generation of technologies that will reduce the impact of climate change through reduced energy consumption and vastly improved health diagnostics.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals by State and Organisation

LE100100055 Prof Caroline Rae, A/Prof Lynne E Bilston, A/Prof Colin W Clifford, Prof Vaughan G Macefield, A/Prof Rosslyn A Simmons, Prof Ronald R Grunstein, Prof Victor Solo, Dr Thomas F Denson, Prof John R Hodges

Approved Project Title **State-of-the-art upgrade to multi-transmit multi-receive technology for research dedicated 3 Tesla magnetic resonance imaging (MRI) scanner**

2010 \$400,000.00

Primary FoR 1701 PSYCHOLOGY

Partner/Collaborating Organisation(s)

The University of Sydney, University of Western Sydney

Administering Organisation The University of New South Wales

Project Summary

Projects requiring the proposed infrastructure are aligned with two National Research Priorities. The research will lead to new methods for imaging and detecting soft tissue changes, identifying developmental, cognitive and degenerative disorders, and pharmacological research. The understanding of the basis of physiological, cognitive and biochemical processes which will be facilitated by the new equipment will contribute to the priority area Promoting and Maintaining Good Health and will underpin an array of subsequent medical research. The new equipment will extend capabilities and training in signal analysis, biomedical engineering and biomedicine, contributing to the priority area Frontier technologies for Building and Transforming Australian Industries.

LE100100054 Prof John W Storey, Prof Michael C Ashley, Prof Michael G Burton, Dr Jonathan S Lawrence, Prof Mark J Wardle, Prof Quentin A Parker, Prof Matthew Colless, Prof Zhaohui Shang, Prof Takashi Ichikawa, Prof Hideaki Motoyama

Approved Project Title **Next-generation robotic observatories for the remote Antarctic plateau**

2010 \$200,000.00

Primary FoR 0201 ASTRONOMICAL AND SPACE SCIENCES

Partner/Collaborating Organisation(s)

Anglo Australian Observatory, Chinese Center for Antarctic Astronomy, Tohoku University
Macquarie University

Administering Organisation The University of New South Wales

Project Summary

Australia's astronomers are exceptionally well placed to lead and to partner with major international programs in Antarctic astronomy. These bring Australian industry increased access to cutting-edge technology, and create business opportunities in the infrastructure and support of Antarctic research. This project aims to maintain Australia's lead in Antarctic astronomy and, with the inclusion of a new partnership with Japan, to build upon our existing strong collaboration with China and the USA. Australia's participation in this program also ensures continued technology exchange, and builds our knowledge base in robotics, harsh-environment engineering and computational fluid dynamics, while creating important new astronomical opportunities.

LE100100059 Prof Iain M Suthers, Dr Matthew D Taylor, Prof Robert C Brooks, Prof Richard T Kingsford, Prof David J Booth, A/Prof Robert G Harcourt, A/Prof William Gladstone, A/Prof Andy R Davis

Approved Project Title **Dual frequency identification SONAR (DIDSON) facility for sampling benthic and pelagic fish populations**

2010 \$100,000.00

Primary FoR 0602 ECOLOGY

Partner/Collaborating Organisation(s)

Macquarie University, The University of Newcastle, University of Technology, Sydney, University of Wollongong

Administering Organisation The University of New South Wales

Project Summary

Many Australians enjoy marine and freshwater resources, and we are exploiting fisheries and waterways in particular at an increasing rate. Effective management of fisheries requires understanding the abundance and behavior of fish. This facility will provide novel acoustic video technology for researchers to count fishes and sharks near weirs, under wharves or logs, and within seagrass beds. The dual frequency identification sonar (DIDSON) will also allow accurate and standardised study of fish movements in response to floods, algal blooms or re-stocking events without disturbing the fish or their habitats. This will enhance our understanding of the top-down control by fish of aquatic ecosystems that are directly adjacent to human activity.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals by State and Organisation

LE100100204 Prof Iain M Suthers, Dr Anthony J Richardson, Dr Kerrie M Swadling, A/Prof Peter J Ralph, Dr Matthew D Taylor, Dr Martina A Doblin, Dr Patti Virtue
Approved Project Title **A laser optical plankton counter for laboratory and in-situ size distributions of zooplankton, to assess the basis and outcomes of changing ecosystems**

2010 \$125,000.00

Primary FoR 0405 OCEANOGRAPHY

Partner/Collaborating Organisation(s)

The University of Queensland, University of Tasmania, University of Technology, Sydney

Administering Organisation The University of New South Wales

Project Summary

The researchers will integrate studies of zooplankton biodiversity from the tropics to the Southern Ocean with an optical plankton counter to quickly measure zooplankton size and approximate shape. This new technology, together with a resurgence in collaborative marine science through the Integrated Marine Observing System and the Sydney Institute of Marine Science, will enable Australian researchers to understand changes in the plankton in freshwater or in estuaries, as well as in the East Australian Current. This current has already strengthened and is predicted to be the area of greatest warming in the Southern Hemisphere. The response of plankton communities to these changes will have profound effects on Australian fisheries and livelihoods.

LE100100096 Dr Pall Thordarson, Dr Chiara Neto, Prof John J Gooding, Prof Gregory G Warr, Prof Laura A Poole-Warren, Prof Hans G Coster, Prof Tom P Davis, Prof Anthony S Weiss, A/Prof Francois Ladouceur, A/Prof Sebastien Perrier, Prof Vicki Chen, A/Prof Brian S Hawkett, A/Prof Martina Stenzel, Prof Marcela M Bilek, Dr Penny J Martens, A/Prof Katharina Gaus, Dr Margaret Sunde, A/Prof Andrew T Harris, Dr Volga Bulmus, Prof Brett A Neilan

Approved Project Title **A unique soft matter high-performance scanning probe microscopy (HP-SPM) facility**

2010 \$450,000.00

Primary FoR 0306 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner/Collaborating Organisation(s)

The University of Sydney

Administering Organisation The University of New South Wales

Project Summary

Soft matter research touches every aspect of our lives as it covers materials from the range of plastics found in cars, television sets and other mass-manufactured products, to new medical materials for tissue engineering and sensors. The proposed facility will enable Australia's leading scientists in this area to understand better how soft matter, including both biological and new advanced soft materials, behaves on the nano-scale level. This will put Australian researchers and engineers in a leading position for developing new treatments against cancer and other diseases, as well as harnessing the power of biology for application in areas such as waste treatment and energy production.

LE100100115 Dr Nagarajan Valanoor, Prof David R McKenzie, Prof Michael Ferry, A/Prof John A Taylor, Dr Cui'e Wen, Prof Marcela M Bilek, Prof Ross C McPhedran, Prof Mark J Hoffman

Approved Project Title **High-temperature probes for investigating phase transitions and reaction kinetics in thin films, nanostructured materials and biomaterials.**

2010 \$350,000.00

Primary FoR 0912 MATERIALS ENGINEERING

Partner/Collaborating Organisation(s)

Deakin University, The University of Queensland, The University of Sydney

Administering Organisation The University of New South Wales

Project Summary

This infrastructure for high temperature surface analysis and in-situ diagnostics as a function of temperature and gas environments will enhance Australia's capabilities in creating new materials for devices that will meet needs in medical, communications, environmental and security applications. The facility will enable researchers to understand and exploit interfacial phenomena and to tailor processing-microstructure-composition correlations, so as to design new materials with the best performance possible. Probes with unique capabilities will measure surface morphology, optical properties, elemental composition and crystallographic phase. The facility will be the first in Australia to offer a comprehensive study of structure and properties at high temperature.