

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

New South Wales

Australian Institute of Nuclear Science and Engineering

LE0882725 Dr D Mather; Prof JW White; Dr BJ Kennedy; A/Prof IR Gentle; Em/Prof SJ Campbell; A/Prof EM Gray; Prof EH Kisi; A/Prof I Low; Prof VM Linton; Dr DP Riley; Dr CJ Howard; Dr TJ Hicks

Approved Project Title **Access for Australian Researchers to Advanced Neutron Beam Techniques**

2008 : \$ 200,000

2009 : \$ 200,000

2010 : \$ 200,000

2011 : \$ 200,000

2012 : \$ 200,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

Australian Institute of Nuclear Science and Engineering (AINSE)

The Australian National University

The University of Sydney

The University of Queensland

The University of New South Wales

Griffith University

The University of Newcastle

Curtin University of Technology

The University of Melbourne

The University of Adelaide

Monash University

ANSTO

Administering Organisation Australian Institute of Nuclear Science and Engineering

Project Summary

The major national benefit will be access, by peer review, to the 35 specialised instruments at the world's leading pulsed Neutron and Muon source, ISIS. This complements the access to the eight neutron instruments that will operate at the Australian Reactor OPAL. This will support (or enable) high quality research into areas as diverse as materials development, mineral processing and aspects of biological and medical science. It will facilitate international collaborations that are important for both research and post-graduate student training.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of New South Wales

LE0882778 A/Prof MG Burton; Dr MR Cunningham; Prof JW Storey; A/Prof AJ Green; Dr A Walsh; Dr ST Maddison; Dr PG Edwards

Approved Project Title **Water vapour radiometers for millimetre-wave phase correction for the Australia Telescope**

2008 : \$ 201,224

Primary RFCD 2401 ASTRONOMICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Sydney

James Cook University

Swinburne University of Technology

CSIRO Australia Telescope National Facility

Administering Organisation The University of New South Wales

Project Summary

Australia has a tradition of excellence in astronomy. Inspired by wonder about the cosmos, it stimulates public interest in science, so leading to the training of highly skilled graduates. In turn, this drives the development of technologies needed to pursue the science. The nation has invested in the technology for millimetre-wave astronomy, building the first interferometer in our hemisphere. This equipment will capitalise on this investment, extending the capabilities of the Australia Telescope to maintain it as a front line instrument, attracting the best scientists here to use it. This will help nurture a vigorous radio-science community, one able to actively participate in the billion-dollar investment being made internationally in the field.

LE0882295 Prof PM Curmi; Dr RL Malby; Prof NE Dixon; Prof R Cavicchioli; Prof PJ Hogg; Dr PJ Lewis

Approved Project Title **X-ray crystallography resource for membrane proteins and large macromolecular complexes**

2008 : \$ 225,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Newcastle

University of Wollongong

Administering Organisation The University of New South Wales

Project Summary

Structural biology is the underpinning of biotechnology, biopharmaceuticals and rational therapeutic design. The most successful technique for determining the structures of proteins and large macromolecular complexes is x-ray crystallography. This proposal will set up a network of state of the art resources in the Sydney region to capitalise on expertise in these areas. The facilities will foster basic research and collaborations with industry, which will enhance Australia's profile and commercialisation of research. The facility will enhance the usage of the Australian synchrotron, producing flagship projects on the edge of technical possibilities.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882512 Prof IW Dawes; Em/Prof PL Bergquist; Prof RJ Trent; Prof RJ Scott; Prof PJ Hogg; Prof MR Wilkins; Prof JK Reichardt; Prof NH Hunt; Prof MS Baker; Prof PR Dunkley

Approved Project Title **Advanced high throughput functional genomics and gene mapping**

2008 : \$ 400,000

Primary RFCD 2702 GENETICS

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Sydney

Macquarie University

The University of Newcastle

Administering Organisation The University of New South Wales

Project Summary

Infrastructure requested will expand the capacity of researchers in NSW to undertake experiments using state-of-the-art technologies based on the recent advances in genomic and proteomic analysis. It will ensure the retention of leading researchers in the exciting areas of functional genomics and systems biology as contribute to biomolecular research in medicine, agriculture and environmental biology, thereby providing major benefits to the wider community. The application aims to enhance existing genomic technologies by adding platforms that will increase the scope of experiments that can be performed as well as providing automation and increased capacity to handle the increasing demand for these techniques

LE0882855 Dr K Gaus; Prof LM Khachigian; A/Prof M Kavallaris; Prof MD Willcox; Prof IW Dawes; Prof SL Kjelleberg; A/Prof JJ Gooding; Prof R Amal; A/Prof LA Poole-Warren; Prof R Stocker; Prof NJ King; Prof MA Vadas; Prof CR Murphy; A/Prof FC Braet; A/Prof AD Conigrave; Prof AS Weiss; Prof TW Hambley; Dr P Thordarson; Dr AR Parker; Prof EM Goldys; Prof HK Nevalainen; Prof NH Packer; Dr JR Rabeau

Approved Project Title **High-resolution imaging of live cells and tissue**

2008 : \$ 900,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Sydney

Macquarie University

Administering Organisation The University of New South Wales

Project Summary

Understanding the machinery of life and developing technologies that support life's processes requires biological and physical scientists and engineers to monitor molecular events in living systems. The aim is to take advantage of very recent developments in light microscopy to enable the non-invasive imaging of live cells and tissue at a previously unreachable level of detail. The instruments will form the nucleus of a new imaging facility. Significant advances in research areas including vascular research, cancer, immunology, cell and molecular biology, functional genomics, biotechnology, nanotechnology and material engineering will be of major benefit both nationally and globally.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882782 Prof GW Greenleaf; Prof AS Mowbray; Prof T Carlin; Dr F Wheeler; Mrs H Culshaw; A/Prof AT Kenyon; Prof MA Adams

Approved **The Australian Legal Scholarship Library - enhancing research infrastructure for**

Project Title **Australian law**

2008 : \$ 169,776

Primary RFCD 2801 INFORMATION SYSTEMS

Partner Organisations & Collaborating Organisations

The University of New South Wales

University of Technology, Sydney

Macquarie University

The Australian National University

The University of Melbourne

University of Western Sydney

The Flinders University of South Australia

Administering Organisation The University of New South Wales

Project Summary

It is difficult to find Australian legal scholarship of the last 50 years because too little of it is available online or searchable from any central location. The Australian Legal Scholarship Library, located on AustLII, will remedy that by creating a comprehensive repository for Australian academic and non-profit law journals, law school repositories for all of their new scholarship no matter where it is eventually published, and smart methods of finding how legal documents relate to each other. People researching Australian law, whether for business, academic or community purposes, will benefit from better access to this wealth of expertise.

LE0882224 A/Prof AR Hamilton; Dr AP Micolich; Prof R Newbury; Dr A Fuhler; Dr T Martin; A/Prof PC Dastoor; Dr UK Divakar; Dr BJ Powell

Approved **Vector Magnetic Field Facility for Nanoscale Spintronic Materials and Device Research**

Project Title

2008 : \$ 440,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Newcastle

The University of Queensland

Administering Organisation The University of New South Wales

Project Summary

Electronic devices underpin a trillion dollar industry worldwide and are an essential part of modern life. Spintronics (spin-electronics) is an emergent technology that combines the electrical and magnetic properties of electrons to represent and process information. Spintronic chips are expected to be fast, versatile, capable of simultaneous data storage and processing, while at the same time consuming less energy. Industry analysts suggest the spintronic market will exceed \$10 billion. This facility will provide the critical infrastructure needed to study the electronic and magnetic properties of nanostructured materials, providing the underpinning knowledge to develop the next generation of spintronic devices.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882388 Dr P Le-Clech; A/Prof V Chen; A/Prof RM Stuetz; A/Prof GL Leslie; Dr SJ Khan; Dr HM Coleman; A/Prof DE Wiley; Prof TD Waite; Prof S Vigneswaran; Dr HK Shon
Approved Project Title **Advanced characterisation of organics and biopolymers in water and wastewater treatment**
2008 : \$ 130,000
Primary RFCD 2505 MACROMOLECULAR CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of New South Wales
University of Technology, Sydney

Administering Organisation The University of New South Wales

Project Summary

Although membrane technology is increasingly used for water production, wastewater treatment and reclamation, fouling by complex bio-organics is a major limitation. The liquid chromatography-organic carbon detection and the Flow FFF equipments give detailed analyses of the complex organics, thereby helping to understand the fouling and organic removal mechanisms allowing process optimisation. The availability of these equipments will dramatically improve the quality of a number of research projects currently funded and being developed in Australia. This equipment would provide necessary infrastructure to keep Australian researchers world leaders in this research field (one of Australian top research priorities) and attract national and international collaborations.

LE0882833 Prof E Leonardi; Dr G Rosengarten; Prof BS Haynes; A/Prof CY Kwok; Dr T Trupke; Prof AG Aberle; Dr RE Nordon
Approved Project Title **Advanced infrared imaging facility for micro to macro systems**
2008 : \$ 120,000
Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of New South Wales
The University of Sydney

Administering Organisation The University of New South Wales

Project Summary

This state-of-the-art infrared imaging equipment will provide significant benefits towards research and development in a wide variety of important areas such as: green house gas reduction through efficient and clean energy production and usage, using solar thermal and solar photovoltaic energy; understanding fire propagation in buildings, and efficiently growing stem cells. This equipment will help maintain Australia's position as a leader in these fields, and thus attract international customers to research and development services in rapidly growing markets such as alternative/renewable energy and biotechnology.

LE0883056 Dr SS Li; Prof C Zhang; Prof MJ Hoffman; Prof J Nowotny; Dr N Valanoor; Dr JA Stride; Dr T Bak; Prof HK Liu; Dr AV Pan; Dr ZP Guo; Dr J Horvat; A/Prof MR Phillips; Dr RY Yang; Dr R Zheng; Dr Y Liu
Approved Project Title **Vacuum Ultraviolet Spectrophotometer and Rapid Photoluminescence Mapping System for Development of Advanced Materials and Biosystems**
2008 : \$ 300,000
Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

The University of New South Wales
University of Wollongong

Administering Organisation The University of New South Wales

Project Summary

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

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883038 A/Prof G Peng; Prof J Canning; Dr GE Town; Dr JL Holdsworth; A/Prof CY Kwok
Approved Project Title Upgrade key fabrication equipment for specialty fibre and device research and development
2008 : \$ 160,000
Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Partner Organisations & Collaborating Organisations

The University of New South Wales
The University of Sydney
The University of Newcastle

Administering Organisation The University of New South Wales

Project Summary

Australia remains a world leader in enabling technologies spanning information and communication, lasers, photonic sensing and diagnostics and much more. Underpinning much of this have been key backbone facilities at UNSW and at Sydney. Optical fibre research internationally is moving in new directions and for Australia to continue its leadership role, dedicated facilities for new generation structured optical fibres, which are already impacting much more significantly than conventional fibres, must be available. The upgrade at UNSW will position Australia to continue its leadership and introduce educational and vocational training for the new industries that will depend on these core technologies.

LE0883080 A/Prof RM Stuetz; Dr SJ Khan; Prof J Keller; A/Prof R Lim; Dr JF Mueller; Prof TD Waite; Prof BA Neilan; Prof S Vigneswaran; Dr P Le-Clech; Dr F Pomati; Dr ME Bartkow; Dr HK Shon; Dr K Rabaey; Dr PL Bond; Dr DJ Batstone
Approved Project Title Detection of Trace Concentrations of Chemical Contaminants in Urban Water Systems
2008 : \$ 490,000
Primary RFCD 2908 CIVIL ENGINEERING

Partner Organisations & Collaborating Organisations

The University of New South Wales
Sydney Water Corporation
The University of Queensland
University of Technology, Sydney

Administering Organisation The University of New South Wales

Project Summary

Water is a critical resource in Australia and as pressures on water resources increase, water recycling is becoming more prevalent. The presence of chemical contaminants such as low concentrations (ng/L) of pharmaceutically active compounds (PhACs), endocrine disrupters (EDCs) and other organic micropollutants in the aquatic environment has received much attention around the world including Australia due to their potential biological impact in urban water systems. The proposed equipment aims to establish analytical techniques and instrumental capacity for the selective analysis of chemical contaminants in order to improve our understanding of the fate of these compounds through different urban water systems.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Newcastle

LE0883095 A/Prof PC Dastoor; Prof J O'Connor; A/Prof BV King; A/Prof A McCluskey; Dr WJ Belcher; Prof CM Stampfl; Dr JR Reimers; A/Prof AR Hamilton; Dr AP Micolich; Dr CJ Fell; Dr SE Watkins; Dr M Bown; Dr AP Stampfl; Dr PJ Evans

Approved Project Title **Integrated Surface Fabrication and Characterisation Laboratory**

2008 : \$ 750,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The University of Newcastle

The University of Sydney

The University of New South Wales

CSIRO Energy Technology Division

Australian Nuclear Science & Technology Organisation (ANSTO)

Administering Organisation The University of Newcastle

Project Summary

New electronic devices and materials that exploit the properties of polymers and organic molecules are predicted to have a major impact on everyday life in areas such as photovoltaics, biotechnology and healthcare. The IntLAB facility will provide researchers for the first time with the unique capability of building and characterising complex multi-layered thin films of polymers and organic molecules completely under controlled environments. The IntLAB represents a major new joint venture between three major Australian Universities, CSIRO and ANSTO and will provide researchers with the essential tools for developing new electronic devices, biosensors, detectors and solar cells based on nanotechnology.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Sydney

LE0882246 Prof MM Bilek; Dr CD Ling; Prof PR Munroe; A/Prof MA Stevens-Kalceff; Dr DP Riley; Dr AS Holland; Prof JF Williams; Prof DR McKenzie; Dr BJ Kennedy; Prof MJ Hoffman; Dr N Valanoor; Prof DG McCulloch; Prof MA Green; Prof CJ Kepert; Dr K Kalantar-zadeh; Prof Dr T Maschmeyer; Dr GJ Conibeer; Dr KA Gross; Prof RP Burford; A/Prof A Mitchell; Prof MW Austin; Dr S Samarin

Approved Project Title Comprehensive Analysis Facility for Thin Films and Surfaces

2008 : \$ 750,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The University of Sydney
The University of New South Wales
The University of Melbourne
The University of Western Australia
RMIT University

Administering Organisation The University of Sydney

Project Summary

The provision of infrastructure for the analysis of thin films will enhance Australia's capabilities in creating new materials and in creating new devices that meet needs in medicine, communications, the environment and security. As devices become smaller, surfaces and interfaces dominate their performance. The new facility will enable researchers to understand the structure and composition of the interior and interfaces of thin films as well as mapping local variations in their key properties. Instruments with unique capabilities will measure elemental composition, crystallographic phase, defect and void distributions and spatially resolved stress, electrical, mechanical and magnetic properties.

LE0883030 Dr JM Cairney; Prof SP Ringer; A/Prof FC Braet; A/Prof M Ferry; Prof CC Sorrell; Prof L Ye; A/Prof AJ Ruys; A/Prof GW Barton; Dr AT Harris; Dr G Ranzi; Prof BJ Eggleton; Dr C Grillet; Prof DR McKenzie; Prof PA Lay; A/Prof AF Masters; Dr AR Parker; Prof RL Overall; Prof AS Weiss; Prof CR Murphy; Dr IM Ramzan; Prof LJ Copeland; Prof DT Potts

Approved Project Title High-Resolution Field Emission Scanning Electron Microscopy (FESEM) Platform for Characterisation at the Nanometre-Level

2008 : \$ 450,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of Sydney
The University of New South Wales

Administering Organisation The University of Sydney

Project Summary

The Field Emission Scanning Electron Microscope (FESEM) is designed to provide fundamental insights into physical and biological systems through characterisation and analysis of structures on nanometre length scales. This versatile instrument will support a wide range of research projects covering all four national research priorities. These range from the characterisation of light alloys to boost and intensify Australia's aluminium, magnesium and titanium alloy industries, to tissue engineering for the repair of human elastic tissues in skin, artery, bladder and lung, to the study of microtubules in plant cells for genetic manipulation of plants to withstand environmental stresses such as drought or salinity.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883068 Dr BD Hambly; Dr S Bao; Dr GA Bishop; Prof J Black; Prof IL Campbell; Dr Q Dong; Dr MD Gorrell; Prof GE Grau; Prof NH Hunt; Prof NJ King; Dr R Markham; Dr DJ Marsh; Dr KL McDonald; Dr SV McLennan; Dr KJ Rodgers; Dr D Seth

Approved Project Title **Dako ACIS III Cellular Image Acquisition and Analysis System**

2008 : \$ 150,000

Primary RFCD 3202 IMMUNOLOGY

Partner Organisations & Collaborating Organisations

The University of Sydney

Administering Organisation The University of Sydney

Project Summary

The scientific advances that will be possible with the acquisition of this novel, cutting-edge instrument will enhance the research outputs of all investigators using it. The ability to visualize and analyze cells and tissues from many different animal species, to elucidate both normal and abnormal functions, will be enhanced by the use of this technology. This will lead to production of quantitative statistical data that in turn will inform new approaches to improve and maintain the health of humans and other animals.

LE0883078 Prof DJ Handelsman; Prof RJ Norman; A/Prof GP Risbridger; A/Prof PY Liu

Approved Project Title **Liquid Chromatography Tandem Mass Spectrometry Steroid Analysis Facility**

2008 : \$ 356,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Sydney

Monash University

The University of Adelaide

Administering Organisation The University of Sydney

Project Summary

This first of a new generation of ultra-sensitive analytical mass spectrometers for small molecules will be established as a national assay facility allowing all Australian researchers open access to a new dimension of highly accurate and simultaneous measurements of multiple bodily chemicals such as steroids, vitamins and hormones. It is crucial to developing new knowledge in basic, developmental and pathological cell biology and for underpinning commercial developments of new molecular targets for therapeutic drugs for many diseases including cancer, cardiovascular disease and reproductive disorders. This facility is pivotal to maintaining international competitiveness in many areas of biological research in national priority areas.

LE0883036 Prof PA Lay; Prof D McNaughton; Prof Dr T Maschmeyer; Prof DT Potts; Prof MV Swain; Prof GE Grau; Prof TC Sorrell; Dr IM Ramzan; Prof J Beardall; Prof CC Bernard; Dr CP Marshall; Dr A Dutkiewicz; Dr DA Penny; Dr BR Wood; Dr W Yang; Dr L Soon; Dr D Traini; Dr EA Carter

Approved Project Title **Integrated Vibrational Spectroscopic Mapping for Archeological, Biological, Geological, Materials, and Medical Research**

2008 : \$ 400,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Sydney

Monash University

Administering Organisation The University of Sydney

Project Summary

The expected benefits that will arise will include: green chemical processes with improved environmental and economic impacts; improved treatments and diagnoses of diseases; understanding of fundamental geological processes; identification of the earliest forms; studies of archaeological artefacts; evolution of life on Earth; the design of improved dental materials. Ultimately, this research will include economic and social benefits in; industrial processes; the mining industry; medicine; and dentistry. An understanding of the origin and early evolution of life on Earth also has many social implications.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882926 Dr X Liao; A/Prof X Wang; Prof Y Mai; Prof L Zhang; Dr JM Cairney; Prof SP Ringer

Approved Project Title **Transmission Electron Microscope-Nanoindenter for Nano-Mechanical Testing**

2008 : \$ 100,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Sydney

University of Wollongong

Administering Organisation The University of Sydney

Project Summary

A transmission electron microscope (TEM)-nanoindenter enables us to record simultaneously the mechanical behaviour of materials under force and their structures and structural evolutions at sub-nanometre resolution. The acquisition of a TEM-nanoindenter will significantly enhance the capability of investigating the structural effect on the behaviour of materials under applied force, which is a key issue in materials science and engineering. The results obtained using the TEM-nanoindenter will reveal the fundamental origins of materials mechanical properties and will be used to improve materials processing procedures and to guide the design of stronger and lighter materials for structural applications.

LE0883032 Dr JP Mackay; Prof G Otting; Prof PW Kuchel; Dr JM Matthews; Dr DA Gell; Prof J Trehwella; Dr PJ Rutledge; A/Prof BA Messerle; Prof MA Vadas; Prof RM Graham; Dr JI Vandenberg; Dr D Stock; Dr GE Ball; A/Prof BD Fazekas de St Groth; Prof J Shine

Approved Project Title **800 MHz NMR spectrometer for biomolecular structure-function analysis**

2008 : \$1,300,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Sydney

The University of New South Wales

The Australian National University

Centenary Institute for Cancer Medicine and Cell Biology

Victor Chang Cardiac Research Institute

Garvan Institute for Medical Research

Administering Organisation The University of Sydney

Project Summary

An understanding of how organisms function at the molecular level is central to developing the ability to fight many diseases in a rational way. This equipment will provide the capability for many different laboratories around NSW and the ACT to advance our knowledge at this fundamental level, primarily by examining the structures and functions of biomolecules such as proteins.

LE0883111 Prof AR Masri; Prof GJ Nathan; A/Prof B Moghtaderi; A/Prof TA Langrish; Dr BB Dally; Prof KD King; Dr ZT Alwahabi

Approved Project Title **A Laser Facility for Imaging the Time Evolution of Scalars in Turbulent Flows**

2008 : \$ 570,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Sydney

The University of Adelaide

The University of Newcastle

Administering Organisation The University of Sydney

Project Summary

Establishing this facility will maintain Australia's position at the international leading edge of research in energy, the environment, combustion, and fluid mechanics. The new diagnostics capabilities will advance science through projects that serve the first National Research Priority and assist industry in the design and development of clean combustion devices and energy efficient technologies. The new facility will also be made available to researchers from non-participating institutions at operating costs and will provide the training platform for graduates from all Australian Universities. This will ensure the continuity of future research and developments in these and related fields in Australia.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883055 Prof SJ Simpson; Prof R Shine; Prof MB Thompson; Dr F Seebacher; Dr AJ Pile; Dr C McArthur; A/Prof RA Coleman; Dr M Beekman; Dr A Ward; Dr GA Sword; Dr RC Brooks; Dr AG Poore; Dr R Bonduriansky; Prof G Cassis; Prof MM Olsson; Prof DJ Booth; Dr SB Williams

Approved Project Title **Video analysis suite for the integrative analysis of resource acquisition behaviour in animals**

2008 : \$ 170,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Partner Organisations & Collaborating Organisations

The University of Sydney
University of Wollongong
The University of New South Wales
University of Technology, Sydney

Administering Organisation The University of Sydney

Project Summary

How do animals find food, choose places to live and select mates? How do insect swarms and fish schools make collective decisions without leaders? These are fundamental questions in understanding the ecological roles and environmental impacts of endangered native and damaging invasive animals. The video analysis suite will be used to analyse the behaviour of such animals in environments from the land to the deep-sea floor; track exceptionally fast movements during courtship and predator escape; study how animals achieve temperature balance in complex habitats; understand the dietary choices of herbivores, and discover the rules that govern the behaviour of swarms.

LE0882935 Dr CR Warren; Prof MA Adams; Prof JP Conroy; Prof DS Ellsworth; Prof DT Tissue

Approved Project Title **Tuneable diode laser for field and laboratory measurement of stable isotopes of CO2**

2008 : \$ 110,000

Primary RFCD 2704 BOTANY

Partner Organisations & Collaborating Organisations

The University of Sydney
University of Western Sydney
The University of New South Wales

Administering Organisation The University of Sydney

Project Summary

The tuneable diode laser system will facilitate projects with major environmental benefits to Australia. Projects will provide major insights into Australia's CO2 balance. This will improve our ability to predict whether ecosystems are net sources or sinks for CO2 -- information that underpins Australia's greenhouse gas balance. The tuneable diode laser system will also benefit Australia's economy via enhancing understanding of agricultural and forest production, a key portion of our GDP. These economic benefits will stem from new knowledge about the limitations to plant growth and the water-use efficiency of plants.

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University of Wollongong

LE0882289 Dr JL Beck; Dr SJ Blanksby; Prof MG Banwell; Prof CJ Easton; Dr JA Aquilina; A/Prof SF Ralph; Prof WE Price; Prof MJ Walker; Prof MR Wilson; Prof SG Pyne; A/Prof PA Keller; Prof MG Humphrey

Approved Project Title **New generation mass spectrometers for characterisation of molecular shape and size**

2008 : \$ 520,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

University of Wollongong

The Australian National University

Administering Organisation University of Wollongong

Project Summary

The ion mobility mass spectrometer (IMMS at UOW) will be the first of its kind in Australia, and together with the ion trap mass spectrometer (ITMS at ANU) will continue the tradition of this partnership in providing researchers with cutting-edge instrumentation for nationally and internationally important projects including: (i) fundamental understanding of the ways in which biomolecules recognize one another, (ii) investigating the structure(s) of lipids (fats) in cardiovascular disease and cataract, (iii) developing anticancer drugs, and (iv) development of new materials.

LE0883113 Prof AR Chivas; Prof RG Roberts; Dr Z Jacobs; Prof CV Murray-Wallace; Dr KE Westaway; Prof MJ Morwood; Prof GC Nanson; A/Prof BG Jones; Dr PF Carr; Dr HV McGregor; Prof CD Woodroffe; A/Prof SD Golding; A/Prof J Zhao; Dr K Yu; Dr JM Pandolfi; Dr GP Halverson; Prof MA Williams; Dr PA Gell; Dr DJ Chittleborough; Prof JR Dodson; Dr D Fink; Dr Q Hua; Dr EJ Hodge; Dr TM Esat; Prof MT McCulloch

Approved Project Title **A stable-isotope mass spectrometer for novel determinations of past temperatures**

2008 : \$ 250,000

Primary RFCD 2603 GEOCHEMISTRY

Partner Organisations & Collaborating Organisations

University of Wollongong

The University of Queensland

The University of Adelaide

Australian Nuclear Science & Technology Organisation

The Australian National University

Administering Organisation University of Wollongong

Project Summary

Much of the Australian landscape is subject to a dry and evaporative climate, making it very difficult to use conventional geochemical techniques to estimate past temperatures, even on short timescales of tens to hundreds of years. The application of a new isotopic technique to preserved carbonate minerals (soil carbonate, shells in rivers, lakes and the ocean) avoids the difficulty of this variable evaporation, and directly measures past temperatures. This will have a profound effect on our understanding of environmental changes on both short and long time scales, and permit a better understanding of the hydrological balances within the landscape.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882347 Prof SX Dou; Dr L Wang; Em/Prof SJ Campbell; Dr R Zheng; A/Prof X Wang; Dr J Zou; Dr X Liao; Dr SS Li; Dr Z Cheng; Dr J Horvat; Dr G Peleckis; Dr AV Pan; Dr Y Zhao; Dr KK Konstantinov; Prof RA Lewis; Dr J Wang; Dr D Shi; Dr ZP Guo; Prof E Pereloma; Dr D Wexler; Dr S Zhou; Dr D Li; Prof RJ Dippenaar

Approved Project Title **High field magnet for materials processing and characterisation**

2008 : \$ 340,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

University of Wollongong
The University of Queensland
The University of Sydney
The University of New South Wales

Administering Organisation University of Wollongong

Project Summary

The proposed infrastructure project will bring many Australian-based researchers together to create a completely new niche of materials processing research. Such a facility will be the first of its kind in Australia. This facility will be located in Australia and thus the time required to process and characterize materials will be significantly reduced without a need to send them overseas. As a consequence of the proposed collaboration, a large number of high quality papers and patents are expected. The facility will increase Australia's position in the field of advanced materials processing and will also provide new ideas and concepts, which will be used in practical applications.

LE0882613 Prof E Pereloma; Prof GG Wallace; Prof GM Spinks; Prof RJ Dippenaar; Prof SX Dou; A/Prof PC Innis; Prof HR Brown; Dr KK Konstantinov; Dr FJ Barbaro; Dr Z Chen; Prof KA Tieu; Prof DP Dunne; Dr A Calka; Dr D Wexler; Dr G Wang; Dr RM Smith

Approved Project Title **An analytical field emission gun scanning electron microscope**

2008 : \$ 600,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

University of Wollongong
BlueScope Steel Limited, Australian Manufacturing Markets Division
BlueScope Steel Limited, Australian & New Zealand Industrial Markets Division

Administering Organisation University of Wollongong

Project Summary

An analytical field emission gun scanning electron microscope is an advanced tool for the characterisation of alloys, nanomaterials, superconductors and polymers. The instrument's advanced characterisation capabilities will significantly enhance the effectiveness of three material-based research institutes and an ARC Centre of Excellence at the University of Wollongong, as well as collaborative research with BlueScope Steel. The research is directly aligned to the National Research Priority of Frontier Technologies for Building and Transforming Australian Industry. The equipment will provide a valuable resource for industries in the Illawarra region of NSW.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Victoria

Deakin University

LE0882948 Dr MR Barnett; Prof PD Hodgson; Prof X Wang; A/Prof L Kong; A/Prof Q Guo; Dr T Lin; Dr C Wen; Dr N Stanford; Dr I Sabirov

Approved Project Title **Multidisciplinary 'Environmental' Field Emission Gun Scanning Electron Microscope**

2008 : \$ 440,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

Deakin University

Administering Organisation Deakin University

Project Summary

The present proposal is for a high resolution electron microscope for use in the development of new materials for the automotive, textile and bio-medical sectors. The new generation of automotive materials will be lighter and more crash resistant. New textiles will be 'active' in providing warmth and cooling through their conducting properties. They will also provide enhanced dynamic protection against physical harm. The facility will support the development of new cellular scaffolds made from metals and polymers. These scaffolds will be used for tissue growth and engineering. The facility will also be used to support Deakin University's regional collaborators.

LE0883093 Prof S Nahavandi; A/Prof B Shirinzadeh; Dr HM Trinh; A/Prof Y Chen; Dr PN Pathirana; A/Prof AZ Kouzani; Dr Y Frayman; Dr Y Zhong; Dr D Creighton; Dr A Bhatti

Approved Project Title **A Haptically enabled Universal Motion Simulator Research Facility**

2008 : \$ 285,000

Primary RFCD 2903 MANUFACTURING ENGINEERING

Partner Organisations & Collaborating Organisations

Deakin University

Monash University

Administering Organisation Deakin University

Project Summary

The proposed universal motion simulator research facility will enable to develop a better understanding of issues involved in ergonomic and safe vehicle designs and provides opportunities to improve Australia's international competitiveness and economic sustainability through innovations in the manufacturing and transport sectors. This universal motion simulator will provide opportunity to extend our understanding of operator controlled devices, such as cars and mining machinery, and to develop effective strategies to reduce the risk of vehicle accidents.

LE0883017 Prof X Wang; A/Prof PJ Halley; Prof L Zhang; A/Prof Q Guo; A/Prof L Kong; A/Prof RW Truss; Dr PJ Torley; Prof L Ye; Prof Y Mai

Approved Project Title **Advanced processing and characterisation facility for functional polymers and polymer nanofibres**

2008 : \$ 300,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

Deakin University

The University of Queensland

The University of Sydney

Administering Organisation Deakin University

Project Summary

The pilot-scale processing and advanced characterisation facility will significantly strengthen R&D capacity for innovative research and development of functional polymers and polymer nanofibres, hence adding value to the \$10-billion plus market for plastics, rubber and biopolymers manufactured and used in Australia. It will further strengthen Australia's position in polymer and nanofibre research and innovation.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

La Trobe University

LE0882878 Dr CI Pakes; Prof JD Riley; Prof S Prawer; Prof CM Stampfl; Prof DN Jamieson

Approved Project Title **Facility for imaging, manipulation and measurement of molecular-scale quantum materials**

2008 : \$ 350,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

La Trobe University
The University of Melbourne
The University of Sydney

Administering Organisation La Trobe University

Project Summary

The development of functional electronic devices relies on understanding how properties on the atomic-scale influence the performance of new device materials. We will develop the capability to image and manipulate surfaces, and enable new protocols for probing the quantum properties of a wide range of materials that cannot currently be accessed at the molecular-level. By facilitating studies of important emerging materials such as diamond, fullerenes and magnetic molecules, the facility aims to place Australia at the forefront of new areas of surface and device science, and to develop new devices for quantum metrology, information and molecular detection within frontier quantum industries.

LE0883021 A/Prof PJ Pigram; Dr N Brack; Dr CI Pakes; Prof JD Riley; Dr CF Hogan; Dr E Hanssen; A/Prof BF Usher; Prof GP Simon; Prof M Forsyth; Dr PA Webley; A/Prof JR Friend; Dr GL Kelly; Dr T Lin; Dr BL Fox

Approved Project Title **Advanced Surface Characterisation Facility**

2008 : \$ 350,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

La Trobe University
Monash University
Deakin University

Administering Organisation La Trobe University

Project Summary

This proposal underpins a major expansion of surface characterisation resources at La Trobe University, one of Australia's leading providers in this field, and builds associated research programs and collaborations, in particular, with Monash University and Deakin University. New opportunities will be provided for hands-on training in state-of-the-art surface characterisation for postgraduates in fields such as physics, chemistry, nanotechnology, materials science and engineering. The Australian community will benefit through internationally significant research outcomes leading to, for example, enhanced medical testing technologies, biocompatible medical appliances, better waste water treatment processes, and new battery technologies.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Monash University

LE0883019 Dr U Bach; Dr MJ Byrnes; Prof DR MacFarlane; Prof Y Cheng; Prof GG Wallace; Prof DL Officer; A/Prof PC Innis; Dr AJ Mozer; Dr JM Pringle

Approved Project Title **Organic Solar Cells Fabrication and Characterisation Facility**

2008 : \$ 150,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

Monash University

University of Wollongong

Administering Organisation Monash University

Project Summary

This application aims to provide key support to ongoing research projects in the area of organic solar cells, which will result in (1) an increase in quality and quantity of research publications and patents (2) a vital support that will establish the grounds for future industries in Australia and (3) a national contribution to the global fight against climate change.

LE0882821 Dr N Birbilis; Prof BC Muddle; Dr J Etheridge; A/Prof CH Davies; Dr PR Miller; Prof YS Estrin; Prof M Forsyth; Prof DG McCulloch; A/Prof SP Russo; Prof PD Hodgson

Approved Project Title **Ion Beam Nanofabrication and Characterisation Facility for Advanced Materials Research**

2008 : \$ 750,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

Monash University

RMIT University

Deakin University

Administering Organisation Monash University

Project Summary

The requested instrumentation is essential to advance a range of activities at the cutting-edge of materials research and in order to maintain world class research activities in Victoria. The instrumentation requested will build on collaborative links and cultivate enhanced usage of existing facilities between partner organisations. The facility will enhance progress in nanotechnology, biotechnology and materials sciences, not only training the next generation of researchers to drive these critical areas, but maintaining Australia's track record as an innovator and developer of advanced materials.

LE0882979 Dr A Buckle; Dr JC Whisstock; A/Prof MC Wilce; Prof IA Smith; Dr SP Bottomley; Prof DA Abramson; Prof GI Webb; A/Prof MJ Garcia de la Banda; Prof WF Appelbe; Prof RL Coppel

Approved Project Title **Australian High Performance Computational Structural Biology Facility**

2008 : \$ 400,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

Monash University

VPAC

Administering Organisation Monash University

Project Summary

This work will have major outcomes for structural biology research at a national and international level. For structure determination, the ability to perform massively parallel calculations will afford a timesaving of weeks to months. Further, significant insights will be gained into the use of high-performance grid computing in protein structure determination by X-ray crystallography. This knowledge has considerable impact on our ability to undertake high quality structural biology research - a key area in the majority of biological research programs. Software developed will be made available to academic researchers free of charge.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883081 Prof PJ Hertzog; Prof B Williams; Prof J Rossjohn; Prof B Adler; Prof AO Trounson; Prof PM Sexton; Prof MC Berndt

Approved Project Title High Content Cell Signaling Discovery and Screening Facility

2008 : \$ 350,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

Monash University

Victorian Infectious Diseases Research Laboratories

Administering Organisation Monash University

Project Summary

The national benefits of this facility will be an increase in basic knowledge of how cells transmit signals to determine their behaviour in normal or stressed situations. There will be high impact publications in learned journals, new IP developed, enhanced education and training in cutting edge technologies. The discoveries from this work will provide candidates for development by the Biotechnology industry in Australia. All of this will promote an innovation culture and economy. The work done in this facility addresses several National Research Priority areas including Promoting and maintaining good health, Frontier technologies for transforming industry and Safeguarding Australia.

LE0882977 Prof SJ Langford; Prof RT Brownlee; Dr C Boskovic; Prof L Spiccia; A/Prof AB Hughes; Prof PC Junk; Prof C Jones; Prof F Separovic; A/Prof M Aguilar; A/Prof MC Wilce; Dr PC Andrews; Dr SR Batten; Dr AJ Robinson; Dr KL Tuck; Dr JA Wilce; Dr BM Abbott; Dr SV Bhosale; Prof MT Hearn

Approved Project Title Enhanced NMR Research, Characterisation and Analysis Facility

2008 : \$ 600,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

Monash University

La Trobe University

The University of Melbourne

Administering Organisation Monash University

Project Summary

Studying molecular species is at the heart of chemistry and biochemistry and fundamental to improving our understanding of molecular mechanisms and interactions. This becomes important for elucidating aspects of biological function, medicinal and pharmaceutical chemistry, materials science and synthetic methodology, which all underpin health and technology advances in Australia. The infrastructure will support projects involving fundamental and strategic research spanning nanotechnology and the biological and materials sciences to industry-oriented projects.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Swinburne University of Technology

LE0882272 Prof J Thomas; Prof B Costar; Prof GJ Williams; Prof RE Tiffen; A/Prof JD Spoehr

Approved Project Title **Australian Policy Online Upgrade Project**

2008 : \$ 100,000

Primary RFCD 3602 POLICY AND ADMINISTRATION

Partner Organisations & Collaborating Organisations

Swinburne University of Technology

The University of New South Wales

The University of Sydney

The University of Adelaide

Administering Organisation Swinburne University of Technology

Project Summary

Australian Policy Online is an open access archive designed to support research in all sectors of the Australian economy, especially within universities. Expected outcomes from this upgrade include improved searching and browsing capabilities, improved preservation of resources and increased sharing and interaction between users of the archive as a result of innovative social software that will allow for comments, user-generated content, tagging and personal library management.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Melbourne

LE0882936 Dr SK Arndt; Dr S Livesley; A/Prof J Beringer

Approved Project Title **MEGA - Mobile Ecosystem Gas-exchange Analyser for Australian landscapes**

2008 : \$ 135,000

Primary RFCD 2799 OTHER BIOLOGICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

This Mobile Ecosystem Gas-exchange Analyser will be able to continuously monitor water, energy, carbon and nitrogen exchange in a multitude of uniquely Australian ecosystems: from low-canopy forests (up to 20m) and afforested plantations to wetlands and agricultural grazing, cropping, horticulture and viticulture systems. This research capacity provides benefits and opportunities such as 1) community resource 2) monitoring tool for carbon and water budgets 3) mobile process laboratory 4) data for model validation. The susceptibility and vulnerability of ecosystems to changing temperature and extended drought will be determined.

LE0882890 A/Prof KJ Barnham; Prof AG Wedd; Prof AI Bush; Prof CL Masters; Dr PS Donnelly; Dr DI Stapleton; A/Prof R Cappai; Dr TD Mulhern

Approved Project Title **Investigating protein/protein interactions**

2008 : \$ 130,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Administering Organisation The University of Melbourne

Project Summary

To establish and maintain a prominent position in scientific research, Australian scientists must have access to state of the art technology. The Bio21 Institute is a multidisciplinary research centre specialising in medical agricultural and environmental science and is ideally suited to house an SPR facility. SPR provides unique functional, kinetic and thermodynamic information on molecular interactions which give rise to both physiological and pathological outcomes. A detailed knowledge of molecular interactions is fundamental to the understanding of all biological systems. When placed at the Bio21 Institute, the facility will foster the development of diversified collaborations between the applicants and the wider research community.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882889 Prof PA Grimshaw; Prof A Curthoys; Prof SL Swain; Prof ME Allen; Reader DE Kirkby; A/Prof JE Long; A/Prof PA Russell; Prof P Brock; Dr FK Paisley; Mr GJ McCarthy; Prof R Frances; A/Prof JB Smart; Dr TN Burrows; Prof JS McCalman; Ms J Evans; Ms J Heazlewood; Ms MH Shapley; Mr B Dewhurst

Approved Project Title **History, the archives and new technologies: developing the Australian women's archives project**

2008 : \$ 150,000

Primary RFCD 4301 HISTORICAL STUDIES

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

The University of Adelaide

The University of Western Australia

La Trobe University

The University of Sydney

Griffith University

Edith Cowan University

National Foundation for Australian Women

Australian Catholic University

National Library of Australia

Public Record Office of Victoria

The Australian National University

RMIT University

Administering Organisation The University of Melbourne

Project Summary

This project will create and define generic tools and services to increase the productivity of those involved with the creation, maintenance and use of source material for humanities research. It will provide a pathway to move this infrastructure onto a more sustainable footing and address issues of information overload, authority and quality facing researchers in the networked digital age. This imperative is seen by scholars and representatives of the nation's major collecting institutions as a primary limiting factor in the contemporary research environment. The project will enhance Australia's reputation as a world leader in the development of web-based information infrastructure to support research and scholarship.

LE0882471 Prof I Marusic; Prof J Soria; Prof MS Chong; A/Prof A Ooi; Dr DR Honnery; Dr JP Monty; Dr N Hutchins; Dr CY Wong

Approved Project Title **Three-Dimensional Optical Laser Velocimetry for the HRNBLWT (High Reynolds Number Boundary Layer Wind Tunnel)**

2008 : \$ 430,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

The experimental information that can be gained from this infrastructure would lead to significant advances in understanding turbulent flows, which would impact a broad range of engineering and geophysical fields. Some specific examples include the development of efficient turbulence control strategies for the reduction of skin-friction drag and improved combustion processes, resulting in not only better fuel efficiency for vehicles but also reduced CO₂ and pollutant emissions. Significant advances could also be made in the area of understanding the dispersion of particles, including pollutants, in the atmosphere; wind turbine design and implementation strategies, and climate change modelling.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883073 A/Prof M Palaniswami; Prof R Kotagiri; Prof RS Tucker; A/Prof IM Atkinson; Dr PN Pathirana; Dr C Leckie; A/Prof PA Mendis; A/Prof R Buyya; Dr MR Duckham; A/Prof SK Halgamuge; Dr GS Woods; Dr L Kulik; Dr E Tanin; A/Prof S Dey; A/Prof B Vo; Prof KA Smith-Miles; Prof M Zukerman

Approved Project Title **BigNet - A Distributed Wireless Sensor Network Testbed**

2008 : \$ 200,000

Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne
James Cook University
Victorian Partnership for Advanced Computing
Deakin University
National Safety Agency

Administering Organisation The University of Melbourne

Project Summary

The infrastructure developed will be of national /international significance, given the rapid emergence of wireless sensor networks. This integrated facility will allow Australia to be a world leading player in the research and technology development as well as the socially responsible deployment of sensor networks. The facility has the explicit aim to ensure that Australia is a technology leader rather than solely a technology user in sensor networks. The test facility will mirror practical requirements for WSN implementation in the Great Barrier Reef and in timber plantation, which would offer substantial economic benefits to Australia.

LE0882913 Dr AW Purcell; Dr NA Williamson; Prof J Rossjohn; A/Prof M Aguilar; Prof J McCluskey; A/Prof TJ Lithgow; Prof RA O'Hair; Dr RB Pearson; Prof P McIntyre

Approved Project Title **Mass spectrometry facility for the quantitation and analysis of post-translationally modified peptides**

2008 : \$ 300,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Melbourne
Monash University
Peter MacCallum Cancer Institute

Administering Organisation The University of Melbourne

Project Summary

This proposal will address a gap in our mass spectrometry capabilities and aid in our understanding of the cellular immune response and investigate the chemical diversity of the targets of immunity. This proposal has broad implications in the basic immunology of antigen presentation, in biomarker discovery as well as in the design of new vaccines in infectious disease and cancer and the development of therapies for autoimmune diseases. In addition to these key scientific outcomes this project will also facilitate the training of several new personnel in a skill area for which there is a critical shortage (mass spectrometry) and promote cross-disciplinary skills (immunology, biochemistry, proteomics).

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882576 A/Prof GG Qiao; Prof F Caruso; Prof WA Ducker; Prof GP Simon; Prof WD Cook; Dr X Zhang; Dr AJ O'Connor; Prof GW Stevens; Dr A Blencowe; A/Prof GV Franks; Dr SE Kentish; Dr RR Dagastine; A/Prof DE Dunstan; Dr SA Bateman; Dr N Birbilis; Dr JS Forsythe

Approved Project Title **Polymer Characterization Facility (PCF)**

2008 : \$ 588,000

Primary RFCD 2505 MACROMOLECULAR CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

CSIRO-MMT

Administering Organisation The University of Melbourne

Project Summary

Future development of macromolecular and biotechnologies have the potential to revolutionize everyday life. Current applications include plastics for engineering, diagnostic devices for biochemical analysis, polymer therapeutics for drug delivery and prosthesis with specific functions. The proposed facility will provide the analytical tools required to probe and develop advanced materials with application in medicine, agriculture, composites, cosmetics, communications and electronics.

LE0882580 A/Prof RE Scholten; Prof KA Nugent; A/Prof A Roberts; Prof S Praver; Dr AD Greentree; Prof GW Baxter; A/Prof SF Collins; Prof H Rubinsztein-Dunlop

Approved Project Title **Laser facility for quantum optics, imaging, and fabrication**

2008 : \$ 400,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

The University of Melbourne

Victoria University

The University of Queensland

Administering Organisation The University of Melbourne

Project Summary

The laser facility will play a role in advancing high-profile leading-edge Australian research underpinning a diverse range of technologies, from quantum communications and quantum computing, to biomedical imaging, fibre sensing and nanofabrication.

LE0882509 A/Prof JP Walker; Prof W Moran; A/Prof JM Hacker; Prof CT Simmons; Prof DA Gray; A/Prof MJ Lynch; Dr L Ge

Approved Project Title **High resolution airborne radar for environmental research: soil moisture, vegetation, salinity and terrain mapping**

2008 : \$ 400,000

Primary RFCD 2605 HYDROLOGY

Partner Organisations & Collaborating Organisations

The University of Melbourne

The Flinders University of South Australia

The University of Adelaide

Curtin University of Technology

The University of New South Wales

Administering Organisation The University of Melbourne

Project Summary

There is a rapidly increasing demand for a range of environmental data. For example, information on soil moisture status is required for efficient and sustainable water use. Moreover, irrigation practices and large scale clearing have led to serious land degradation through increased salinity from rising water tables. Combined soil moisture and salinity measurement will provide important insight to this complex issue. Further, understanding the complex and rich biodiversity of Australian flora and its adaptation to droughts and fire is essential to ensuring Australian ecosystem longevity. Knowledge of flora changes through time as a function of soil moisture content and salinity is key to gaining this understanding.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882938 Prof RL Webster; Prof FH Briggs; Prof JM Dickey; A/Prof MJ Lynch; Prof LG Staveley-Smith; A/Prof AJ Green; Prof M Bailes; Dr CJ Lonsdale; Dr BJ Boyle; Dr LJ Greenhill; Prof RJ Sault

Approved Project Title **MIRA Widefield Array: a new low frequency telescope**

2008 : \$ 750,000
2009 : \$ 680,000

Primary RFCD 2401 ASTRONOMICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of Melbourne
The Australian National University
University of Tasmania
Curtin University of Technology
The University of Western Australia
The University of Sydney
Swinburne University of Technology
MIT
CSIRO - Australia Telescope National Facility
Smithsonian Astrophysical Observatory

Administering Organisation The University of Melbourne

Project Summary

A new radio-quiet site for international radio astronomy is being developed at Boolardy in Western Australia. We have constructed a low frequency test array on the site, and established that the site is excellent for radio astronomy. We plan to build a telescope which will observe the early universe, when stars and galaxies were first born. This will be the first telescope capable of this type of measurement of the early universe. In addition, the telescope will measure the solar wind, and its potential interactions with the Earth.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Queensland

Queensland University of Technology

LE0883074 Prof A Ghosh; Prof GF Ledwich; Prof TK Saha; Prof PJ Wolfs; A/Prof ZY Dong; A/Prof PJ O'Shea; Dr N Hossein Zadeh; Dr GR Walker; Dr F Zare; Dr R Majumder

Approved Project Title **Distributed Generation Evaluation Facility and Power Control**

2008 : \$ 600,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Partner Organisations & Collaborating Organisations

Queensland University of Technology
The University of Queensland
Central Queensland University

Administering Organisation Queensland University of Technology

Project Summary

The development and demonstration of Distributed Energy Resource solutions will assist the deployment of greenhouse gas reduction strategies and of reliability improvements with particular benefits for rural and remote electricity supply. Small generation units can be the best solution for some reliability and voltage support issues in rural/remote networks. The research will show how these can be operated and the benefits achievable for sources including renewables in a manner that is accessible to communities and with a rigorous set of test scenarios that will satisfy concerns from utilities. The flexible system nature is the significant development previously unavailable to researchers/developers.

LE0882942 A/Prof A Rakotonirainy; Prof GA Jull; Prof AN Pettitt; Prof JM Wood; Prof MC Sheehan; Prof NL Haworth; A/Prof JD Davey; Em/Prof RJ Troutbeck; Dr JM Treleaven; Dr MJ King

Approved Project Title **Advanced Driving Simulator for Injury Prevention Research**

2008 : \$ 350,000

Primary RFCD 3504 TRANSPORTATION

Partner Organisations & Collaborating Organisations

Queensland University of Technology
The University of Queensland
Motor Accident Insurance Commission MAIC
RACQ -The Royal Automobile Club of Queensland
Queensland Transport (QT)
Queensland Department of Main Roads

Administering Organisation Queensland University of Technology

Project Summary

Tragically road crashes are still the major cause of traumatic death and injury in Australia with an economic and social burden estimated at over \$17 billion per year. This internationally recognised research team proposes to use a world leading advanced driving simulator for experimental studies to reduce the carnage and loss on Australian roads. It is vital that Australian researchers are granted access to the highest possible standard of driving simulator technology to facilitate state-of-the-art research that could not otherwise be undertaken on open road settings due to ethical and safety reasons and cost limitations. This advanced driving simulator will support regulations regarding automotive safety.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Queensland

LE0882507 Prof DJ Carter; Prof JA Hay; Prof RA Fotheringham; Dr L Dale; Mr KG Webster; Ms J Huggins; Ms KM Kilner; Prof BH Bennett; Prof PR Eggert; Mr JF Arnold; Prof RW Dixon; Prof EA Webby; Mr RH Coleman; Mr P Minter; Prof CM Bradford; Ms AH Horn; Prof W Ommundsen; Dr E Blackmore; A/Prof CM Taylor; Asst Prof RA Phiddian; A/Prof TA Bunda; Dr P Mead; Prof DJ Haskell; Dr TN Burrows; Ms DM Bird; Prof KM Mallan; Prof AJ Patterson; Ms CD Young

Approved Project Title **AustLit Phase Two: Research Infrastructure for Humanities and Education Researchers**

2008 : \$ 500,000

Primary RFCD 4202 LITERATURE STUDIES

Partner Organisations & Collaborating Organisations

The University of Queensland
The University of New South Wales
Monash University
The University of Sydney
University of Wollongong
The Flinders University of South Australia
The University of Western Australia
Deakin University
James Cook University
University of Tasmania
Queensland University of Technology

Administering Organisation The University of Queensland

Project Summary

The benefits of delivering a fully mature research and information facility to the education and research sectors and the general public will accrue over time by providing discovery and analysis opportunities to large numbers of enquirers. The capacity to reveal the wealth and diversity of a nation's cultural activities across its history is an inherent good and the resulting research activities will encourage a greater engagement with Australia's literary culture of the present and the past.

LE0882219 Prof HJ Chenery; Prof NG Martin; Prof DH Shum; Prof GS Halford; Dr GI de Zubicaray; Dr DA Copland; Dr MJ Wright; Dr AP Bradley; Dr SP Finnigan; Dr TR Cutmore

Approved Project Title **Infrastructure for an integrated cognitive neurophysiological research facility: Mapping the neurobiology of memory and language.**

2008 : \$ 100,000

Primary RFCD 3801 PSYCHOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland
Queensland Institute of Medical Research
Griffith University

Administering Organisation The University of Queensland

Project Summary

The Integrated Cognitive Neurophysiological Research Facility will enhance Australia's national research capacity in cognitive neuroscience by enabling large numbers of researchers and graduate students to investigate the neuroscience of memory and language in a collaborative, multi-disciplinary research environment. The facility will deliver national benefits by uncovering the ways in which areas of the brain are used to remember events and process language. This information can then be used to understand how damage to the brain (such as in stroke or disease) can disrupt memory and language and subsequently lead to more effective neurorehabilitation techniques.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0883096 Dr JJ De Voss; Dr CM Williams; Dr RP McGeary; Prof I Toth; Prof DP Fairlie; A/Prof LR Gahan; Dr JT Blanchfield; Prof CJ Easton; Prof MG Banwell; Prof LN Mander; Prof SB Wild; Dr MS Sherburn

Approved Project Title Analytical and Preparative Enantioselective Chromatography

2008 : \$ 600,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Queensland

The Australian National University

Administering Organisation The University of Queensland

Project Summary

Enantiomers are forms of the same molecule that are non-superimposable mirror images of one another, like a left hand and a right hand. Because they are so similar they are very difficult to separate. However, they have very different biological properties, such as when used as drugs. One enantiomer may be beneficial while the other has no effect or sometimes is even toxic. Therefore it is important to be able to tell how much of each enantiomer is present in a sample and to be able to separate them. This facility will allow us to do both of these things.

LE0882787 Prof GM Lu; Dr J Zou; Prof J Drennan; Prof R Amal; Prof HK Liu; Prof MA Kendall; A/Prof IR Gentle; Dr DJ Martin; Dr J Zhu; Dr D Jurcakova; Dr AF Dexter; Dr X Yao

Approved Project Title An Integrated Raman Microscope and in Situ STM-TEM Analysis System

2008 : \$ 390,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Queensland

The University of New South Wales

University of Wollongong

Administering Organisation The University of Queensland

Project Summary

The imaging and analytical capabilities of SEM and chemical and structural characterisation afforded by Raman spectroscopy will be unique, allowing both rapid morphological observation and elemental analysis at the macro and nanoscale. The in-situ TEM holder will further assist through in-situ characterization of advanced materials at the nano-scale level. In combination, these instruments will underpin groundbreaking research in diverse research fields developing new advanced nanomaterials and bio-nanomaterials with significant impact on many industries with great economical and environmental benefits.

LE0882345 Prof JB Mattingley; Dr R Cunnington; Dr RL Hester; Dr MA Bellgrove; Prof OV Lipp; Dr GM Wallis; Prof IM Brereton; Prof GJ Galloway; Dr GI de Zubicaray; Prof S Crozier; Prof PB Colditz; Prof GA Jull; Prof PW Hodges; Prof M Coltheart; Prof S Crain; Dr MA Williams

Approved Project Title A 3.0 Tesla MRI system for human cognitive neuroscience research

2008 : \$ 650,000

Primary RFCD 3801 PSYCHOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland

Macquarie University

Administering Organisation The University of Queensland

Project Summary

For the first time scientists are beginning to reveal the complex relationship between human brain function and behaviour. These advances have stemmed almost exclusively from the development of sophisticated brain scanning techniques that provide high-resolution images of physiological changes associated with perceptual, cognitive and motor behaviours. This application seeks support for a state-of-the-art scanner to obtain high-resolution images of the brain as healthy adults perceive, think, learn, remember and decide. The facility will enable Australian scientists to understand the complex links between brain and behaviour in health and disease.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882864 Dr FA Meunier; Prof JL Stow; Prof RG Parton; Dr PG Noakes; Dr EJ Coulson; Dr AL Munn; Dr JD Hooper
Approved Project Title **High Speed Fluorescence Imaging coupled with Total Internal Reflection Microscopy and Fluorescence Recovery After Photobleaching System**
2008 : \$ 260,000
Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland

Queensland University of Technology

Administering Organisation The University of Queensland

Project Summary

The addition of the TIRF equipment will provide researchers with access to one of Australia's most technologically advanced light microscopy systems. This system will support research across a number of high profile areas, and promote strategic collaborations in cell and neurobiology. The high resolution fast acquisition TIRF system will significantly enhance research capacity and research excellence. Its acquisition will allow Australia to play a major role in the global challenge to advance understanding of cellular and molecular events, contributing significantly to the National Research Priority Area of Frontier Technologies for Building and Transforming Australian Industries.

LE0882275 Prof P Sah; Prof PF Bartlett; Prof JJ McGrath; Prof P Poronnik; A/Prof D Markovich; Prof A Mackay-Sim
Approved Project Title **Facility for analysing behaviour, learning and motor skills in animal models**
2008 : \$ 110,000
Primary RFCD 2706 PHYSIOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland

Griffith University

Queensland Health

Administering Organisation The University of Queensland

Project Summary

Mental disorders are one of the largest costs to the community today and account for more than 50% of the time lost from work. Moreover, these disorders are disabling conditions that relate to fundamental, basic questions of identity and individuality. This collaborative behavioural facility at The University of Queensland will underpin excellent research into how neurological changes affect behaviour and thinking, provide infrastructure to test current models on brain functions, and support the development of new compounds to treat these disorders, thus resulting in significant national and community benefits in improved health outcomes and increased work productivity.

LE0882221 Prof GB Schaffer; A/Prof M Ferry; Dr MR Barnett; A/Prof K Xia
Approved Project Title **A National Facility for Light Metal Powder Processing**
2008 : \$ 580,000
Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Queensland

The University of New South Wales

Deakin University

The University of Melbourne

Administering Organisation The University of Queensland

Project Summary

Light metals research is a designated national priority and under the national Light Metals Action Agenda, Australia recognizes a strategic interest in the growth of global markets for light metals and light metal technology in key sectors such as vehicles for road, rail and marine transport; and in the production, processing and applications of the light metals. The proposed Facility will provide the critical level of investment and the strategic national focus necessary to achieve competitive advantage in powder metallurgy processing. It will underpin substantial developments in the light metals industry nationally and globally. It will also support high profile Australian research groups.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882357 Prof SC Smith; Dr M Hankel; Prof SK Bhatia; Prof GM Lu; Prof AP Middelberg; Prof JJ Cooper-White; Prof AE Mark; Prof RG Gilbert; A/Prof P Meredith; Dr T Huber; Prof AB Yu; Prof O Ostrovski; Dr RY Yang; A/Prof G Peng; Dr J Bao; A/Prof DJ Bernhardt; Prof JF Dobson; Dr YG Anissimov; A/Prof PR Johnston

Approved Project Title **A Computational Facility for Multi-scale Modelling in Bio and Nanotechnology**

2008 : \$ 500,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Queensland

Griffith University

The University of New South Wales

Administering Organisation The University of Queensland

Project Summary

Bio- and nanotechnology have the potential to transform Australian industry and research, and to bring significant benefits for consumers. The scope will include materials for energy storage, medical diagnostics and cellular imaging, bioengineering, drug and gene delivery, improved foods by molecular design, novel materials for electronics, improved techniques for particle processing, and molecular sieves for filtering/purifying water and gases. The dedicated computing facility will enable a fast interactive cycle between simulation and experiment in these areas, accelerating the pace of research and applications.

LE0882818 A/Prof PM Vasconcelos; Prof AJ Gleadow; Dr TR Ireland; Dr M Gasparon; Dr KM Knesel; Dr G Rosenbaum; A/Prof BP Kohn; A/Prof D Phillips; Prof MA Sandiford; Prof CJ Wilson; Dr AF Saint; Dr IS Buick; Dr MA Forster; Dr M Honda; Prof GS Lister; Prof I McDougall; Prof BJ Pillans; Dr D Rubatto

Approved Project Title **Investigating the Structure and Evolution of the Continental Crust: A Virtual Facility for Thermochronology, Noble Gas Geochemistry and Geochronology**

2008 : \$ 650,000

Primary RFCD 2601 GEOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland

The University of Melbourne

The Australian National University

GBC Scientific Instruments Pty Ltd

Administering Organisation The University of Queensland

Project Summary

Australian research groups have been responsible for a number of leading technical developments in geological dating. This project will continue that track record and provide the core infrastructure to support a major collaborative research strength that can address both fundamental scientific questions about the evolution of the Earth's crust and surface environment, as well as important economic applications of that knowledge. These include the search for petroleum and mineral deposits, thereby addressing the National Priority Goal: Developing deep-earth resources. The project will strengthen links with other national and international researchers, and build Australia's research profile in an area of significant worldwide scientific interest.

South Australia

The Flinders University of South Australia

LE0882563 Prof N Brewer; Dr RL Young; Dr N Weber; Dr AM Ma-Wyatt; Dr C Semmler; Prof RA McKinnon

Approved Project Title **A Multi-Function Eye-Tracker Facility**

2008 :

\$ 120,000

Primary RFCD 3801 PSYCHOLOGY

Partner Organisations & Collaborating Organisations

The Flinders University of South Australia

The University of Adelaide

University of South Australia

Administering Organisation The Flinders University of South Australia

Project Summary

Eye-tracking data will provide crucial insights into fundamental issues in the areas of (a) decision processes in eyewitness identification, (b) attentional deficits in autism, and (c) the role of saccades in goal-oriented movements. In turn, these advances have important ramifications for (a) the administration of justice, (b) understanding autism and ameliorating its consequences, and (c) the control of movement in normal and disabled populations. The Facility brings together a diverse group of established and early career researchers, many of whom have already demonstrated a capacity to collaborate effectively, providing exciting new collaborative research directions that will enhance Australian science and PhD student training.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Adelaide

LE0882493 Dr J Brugger; A/Prof CT Chantler; Prof AM Bond; A/Prof BK O'Neill; Prof D McNaughton; Prof AR Gerson; Dr CG Ryan; Dr W Liu; Dr SP Best; Prof L Spiccia; Prof P Mulvaney; Prof RN Lamb

Approved Project Title **High-accuracy spectroscopy under extreme conditions: combining novel synchrotron and laboratory-based spectroscopy**

2008 : \$ 700,000

Primary RFCD 2403 ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PHYSICS

Partner Organisations & Collaborating Organisations

The University of Adelaide
The University of Melbourne
Monash University
University of South Australia
CSIRO
Australian Synchrotron

Administering Organisation The University of Adelaide

Project Summary

This project aims at maintaining the leading position of Australia in nationally important fields such as ore and environmental geology, ore processing and metallurgy, nano- and bio-technology. This project aims to establish an integrated set of state-of-the-art, often unique and revolutionary new tools, taking in particular advantage of local innovation in instrumentation and spectroscopy theory, of the investment in major facilities (Australian Synchrotron). By improving cross-disciplinary links among research groups interested in in-situ spectroscopy (Earth Sciences, Physics, Chemistry, Biological Sciences, Biochemistry, Biomedicine, Engineering), this application will result in major scientific and industrial advances.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

University of South Australia

LE0882382 Prof DA Brooks; Dr KE Shearwin; Prof RA McKinnon; Dr EJ Parkinson-Lawrence; Prof JC Wallace; Prof AM Evans; Dr DJ Peet; Dr R Morona; A/Prof ML Whitelaw; Dr HW Ecroyd; Dr SM Pitson; Prof AF Lopez; Dr BE Forbes; Dr CJ Sumbly; Prof HA Morris; Prof JJ Hopwood

Approved Project Title **Biophysical Characterisation Facility**

2008 : \$ 245,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

University of South Australia

The University of Adelaide

Institute of Medical and Veterinary Science

Adelaide Women's and Children's Hospital

AIB Laboratories (Bio-Innovation SA)

Administering Organisation University of South Australia

Project Summary

The protein analysis facility will have substantial benefits for basic science and biotechnology. It will create capacity for South Australian researchers to study proteins at the biophysical level. The facility will support research projects within the designated national research priority areas of 'Frontier technologies for building and transforming Australian industries' and 'Promoting and maintaining good health

Western Australia

Curtin University of Technology

LE0882836 Prof K Grice; Dr PF Grierson; Dr PF Greenwood; Dr JJ Brocks; Prof D Zhang; A/Prof A Heitz

Approved Project Title **A novel isotope facility to characterise high-molecular-weight fractions of natural organic matter in soils, sediments, water, petroleum and coal**

2008 : \$ 160,000

Primary RFCD 2603 GEOCHEMISTRY

Partner Organisations & Collaborating Organisations

Curtin University of Technology

The University of Western Australia

The Australian National University

CRC-WQT

John de Laeter State Centre of Mass Spectrometry

Administering Organisation Curtin University of Technology

Project Summary

This facility will improve our ability to forecast environmental responses to future climate change, and help Australia manage current threats to its biodiversity. Furthermore, this research will increase the ability to identify crude oil sources, to the benefit of petroleum exploration in Australia. This facility will also contribute to an improved understanding of controls on water quality and will help to protect our precious freshwater resources, already under intense pressure from climate change. Importantly, this project will enable students and young professionals to be trained in state-of-the-art technology, leading to quality scientists ready for employment in industry.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Western Australia

LE0882893 Prof CA Atkins; Dr OK Babourina; Dr BC Baer; Dr PL Clode; Dr KW Dixon; Prof SA Dunlop; Dr H Eubel; Dr L Filgueira; Dr MR Kilburn; Prof SP Klinken; Prof JJ Kuo; A/Prof NG Laing; Prof PJ Leedman; Dr M Ludwig; A/Prof DJ Macey; Prof AH Millar; Dr F Pixley; Dr M Saunders; Prof K Siddique; Prof Dr K Sivasithamparam; A/Prof TG St Pierre; Prof RC Thompson; Prof JM Whelan; A/Prof MH Zheng; Dr M Ziman

Approved Project Title **A cryopreparation facility for Western Australia**

2008 : \$ 260,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Western Australia

Murdoch University

Edith Cowan University

Administering Organisation The University of Western Australia

Project Summary

Western Australia is home to a number of world-leading biological and biomedical research groups and some of the best microscopy facilities in the country. Establishing a world-class cryopreparation facility in WA will enable local researchers to remain at the forefront of their research fields and will serve to attract additional high profile international scientists and students to WA. Significant research advancements in areas such as genetic muscular diseases, nerve regeneration, parasitic infection in humans, crop optimisation and tolerance to environmental conditions, and animal growth and reproduction, will result from the establishment of such a facility.

LE0882792 Prof DG Blair; Prof J Munch; Prof DE McClelland; Dr L Ju; Dr C Zhao; A/Prof PJ Veitch

Approved Project Title **High Power Laser, Test Masses, Digital Control System and Vacuum System for High Optical Power Interferometry Experiments**

2008 : \$ 600,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of Western Australia

The University of Adelaide

The Australian National University

Administering Organisation The University of Western Australia

Project Summary

Gravitational waves are expected to offer humanity a completely new spectrum with which to study the Universe. Australia has been a pioneer in the quest to open up this new spectrum. This project will allow Australia to play a key role in a world-wide project which aims for the first time to enable gravitational waves to be detected from black holes and neutron stars throughout the universe. It will give Australia access to developed technologies, and will be a major boost to physical science research and education.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882866 Prof AH Millar; Prof SM Smith; Prof CL Raston; Prof RN Martins; Prof LW Simmons; Prof JK Olynyk; Prof GA Stewart; Prof PJ Leedman; Prof LD Beazley; Prof JM Whelan; A/Prof PV Attwood; Dr A Vrieling; Prof CS Bond; Prof SA Dunlop; Dr AJ Bakker; Dr PG Arthur; Prof GC Yeoh; Dr JL Heazlewood; Dr BC Baer; Dr H Eubel; Dr NL Taylor; Dr G Verdile; Dr PG Besant; Dr KL Swaminatha-Iyer; Dr PM Finnegan; Dr M Ludwig

Approved Project Title MALDI Imaging and Protein Analysis Facility for WA

2008 : \$ 470,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Western Australia

Edith Cowan University

Administering Organisation The University of Western Australia

Project Summary

Mass spectrometry as a tool for analytical research can be coupled to imaging of tissues to provide an important bridge between biochemical, cell biology and physiological sciences. These are competitive research areas that need the latest in speed, accuracy and sensitivity. Strategic placement of such infrastructure in locations of research strength is vital to allow hand-on use that promotes excellence, innovation and creative exploration of the limits of such tools to answer pressing questions in biology and chemistry. WA students and researchers will gain new opportunities in an arena of MALDI imaging in biological research and intact protein analysis for structural studies.

LE0882634 Prof CL Raston; Dr VK Pareek; Prof CS Bond; A/Prof PC Burcham; A/Prof HT Chua; Dr GR Flematti; Dr L Gao; Dr KL Swaminatha-Iyer; Dr L Lim; Dr M Makha; Dr M Norret; Dr M Polomska; A/Prof P Price; Dr RI Price; A/Prof TG St Pierre; Dr SG Stewart; Dr DA Wild; Prof GC Yeoh; Prof E Bakker; Dr DH Brown; Prof R De Marco; Prof JD Gale; Dr Q Li; Dr X Lou; Prof MO Tade; Dr S Wang; Prof K Wright

Approved Project Title Integrated Process Intensification Facility

2008 : \$ 220,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Western Australia

Curtin University of Technology

Administering Organisation The University of Western Australia

Project Summary

The new equipment will provide a unique facility for process intensification (PI). No other techniques are capable of controlling features of nano-particles (size, shape, agglomeration, phases and defects) under continuous flow, which is essential for applications in nano-technology. There are unique capabilities of PI in chemical synthesis, including drug development and drug discovery. Overall, applications of PI cover health care products, device technology, and more, for the benefit of the community at large. The facility will foster a more innovative research culture and provide excellent research training at the highest international level, and will provide a platform to foster greater links with industry.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Tasmania

University of Tasmania

LE0882701 Prof J Vickers; Prof SJ Foote; Dr DH Small; Prof EH Walters; Prof GM Hallegraeff; A/Prof AK West; Dr R Chung; A/Prof GM Woods; Dr TC Dickson; A/Prof BF Nowak; Dr CJ Bolch; Dr J Patil

Approved Project Title Establishment of a confocal/multiphoton microscope for imaging of living systems

2008 : \$ 300,000

Primary RFCD 3207 NEUROSCIENCES

Partner Organisations & Collaborating Organisations

University of Tasmania

CSIRO

Administering Organisation University of Tasmania

Project Summary

This facility will allow us to study the dynamic changes in living systems, from the smallest unicellular organisms in the ocean through to the sophisticated neural networks of the living brain. Not only will this imaging facility allow us to understand how living systems work, we will also be able to explore the dynamic changes that underlie human disease and injury.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Australian Capital Territory

The Australian National University

LE0882854 Prof RJ Arculus; Prof P De Deckker; Dr NF Exon; Prof ME Barley; Dr JJ Brocks; Dr MB Clennell; Prof A Cooper; Prof JR Dodson; Dr RN Drysdale; A/Prof CL Fergusson; A/Prof JM Hergt; Dr WR Howard; Prof AP Kershaw; Prof TC McCuaig; A/Prof RD Muller; Dr IR Poiner; Prof SY O'Reilly; Dr JM Webster; Dr CJ Yeats; A/Prof PM Vasconcelos; Dr JD Stilwell

Approved Project Title Australian Membership of the Integrated Ocean Drilling Program

2008 : \$1,200,000

2009 : \$1,200,000

2010 : \$1,200,000

2011 : \$1,200,000

2012 : \$1,200,000

Primary RFCD 2601 GEOLOGY

Partner Organisations & Collaborating Organisations

The Australian National University

CSIRO

MARGO

Macquarie University

James Cook University

The University of Adelaide

The University of Melbourne

Monash University

The University of Newcastle

The University of Queensland

The University of Sydney

University of Tasmania

The University of Western Australia

University of Wollongong

AIMS

ANSTO

Administering Organisation The Australian National University

Project Summary

Membership of the Integrated Ocean Drilling Program (IODP) will provide high-leverage access to the largest, and most effective international geoscience program.

Results from drilling within Australia's marine jurisdiction will give understanding of the oceans' state under past climates through high resolution records of the range of oceanographic and biological responses to climate change, the role of the deep biosphere in shaping oil and gas deposits, hydrothermal and igneous processes involved in ore genesis, and enhanced understanding of some of the world's largest earthquake- and tsunami-generating processes.

LE0882531 Dr JD Close; Dr NP Robins; Prof HA Bachor; Dr BC Buchler; Dr P Lam; Prof P Hannaford; Prof A Sidorov; Dr BV Hall; Dr CJ Vale; Prof H Rubinsztein-Dunlop; A/Prof NR Heckenberg

Approved Project Title Quantum Limited Single Atom Detectors

2008 : \$ 250,000

Primary RFCD 2403 ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PHYSICS

Partner Organisations & Collaborating Organisations

The Australian National University

Swinburne University of Technology

The University of Queensland

Administering Organisation The Australian National University

Project Summary

The technology that has shaped our society, solid state diodes, transistors and computer chips is based on our ability to manipulate the average quantum properties of materials such as semiconductors. This physics has been well understood for decades. Many technologies that will shape our societies in this century will be based on our ability to manipulate quantum systems precisely, an area that is the focus of quantum atom optics. The detectors requested in this proposal will ensure that Australia remains competitive in the technologies that will emerge from the new field of quantum atom optics.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0882682 Dr SG Haberle; Dr B Evans; Mr SC Hungerford; Prof G Hope; Prof M Kljakovic; Prof AP Kershaw; Prof JR Dodson; Prof DM Bowman

Approved Project Title **The Australasian Pollen and Spore Atlas**

2008 : \$ 100,000

Primary RFCD 2801 INFORMATION SYSTEMS

Partner Organisations & Collaborating Organisations

The Australian National University
Monash University
ANSTO

University of Tasmania

Administering Organisation The Australian National University

Project Summary

The results generated in this project will enhance Australian research capabilities across multiple disciplines by providing access to key knowledge of pollen and spores in our region. A unified approach to the archiving, presentation and accessibility to existing and evolving databases will provide a considerably improved context for identification and knowledge pooling of any given pollen or spore type. This will create a nexus for novel interactions between researchers and end users of these data from within and beyond Australia's borders.

LE0882816 Prof C Jagadish; Dr HH Tan; Prof JS Williams; Prof B Luther-Davies; A/Prof TJ Senden; A/Prof VS Craig; Prof RG Elliman; Dr YJ Wong-Leung; Dr L Fu; Dr JE Bradby; Dr Q Gao; Dr Q Li; Dr A Ashrafi; Dr HT Hattori; Prof L Faraone; A/Prof JM Dell; Dr G Parish; Prof YS Kivshar; Dr DN Neshev; A/Prof Y Chen; Dr AV Rode; Dr S Madden; Dr KJ Grant

Approved Project Title **Micro and Nanostructure Optical Characterisation Facility**

2008 : \$ 500,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The Australian National University
The University of Western Australia
Defence Science and Technology Organisation

Administering Organisation The Australian National University

Project Summary

This facility will allow the carrying out of research in the area of micro and nanostructures which are of interest to Australian industry. Access to state of the art facilities will provide opportunities to train PhD students and post-doctoral fellows in the advanced science and technology fields of national and industrial interest. New technologies developed in this area have the potential to improve the quality of life, e.g. National security, communications, health care.

LE0882262 Dr DH Macdonald; Dr KR McIntosh; Dr KJ Weber; Dr ET Franklin; Prof AW Blakers; Prof A Cuevas; Prof RG Elliman

Approved Project Title **Photoluminescence imaging equipment for advanced silicon materials and solar cells**

2008 : \$ 135,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The Australian National University

Administering Organisation The Australian National University

Project Summary

As the search for carbon-neutral sources of electricity intensifies during this century, an early lead in key technologies will be of great importance. Photovoltaics, in which Australian research is world-class, is clearly one such technology. The proposed equipment would enable Australia to maintain and extend its leading role in the development of silicon photovoltaics. As a result, it will help Australia take advantage of the growing global boom in solar energy. The proposal is likely to generate commercially valuable outcomes, as well as scientific knowledge of intrinsic value. It will also increase support for Australia's existing photovoltaic industry.