

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

New South Wales

Australian Institute of Nuclear Science and Engineering (AINSE)

LE0989127 Dr D Mather; Prof G Kearley; Prof JD Gale; Prof GA Hope; Prof CJ Kepert; Dr JA Stride; Prof J Bartlett; Prof SX Dou; Dr DP Riley; Dr DJ Goossens; Dr C Yang

Approved Project Title **A High-Throughput Neutron Spectrometer for The Study of Atomic and Molecular Motion at ANSTO**

2009 : \$ 400,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

Australian Institute of Nuclear Science and Engineering (AINSE)

The University of New South Wales

Griffith University

The University of Sydney

University of Wollongong

Curtin University of Technology

University of Western Sydney

Australian Nuclear Science & Technology Organisation (ANSTO)

The University of Melbourne

The Australian National University

Administering Organisation Australian Institute of Nuclear Science and Engineering (AINSE)

Project Summary

Neutron scattering enables new science across a broad range of disciplines, and for this reason it is undergoing major expansion in the USA, Europe, Japan and Australia. Various diffractometers and spectrometers have recently been built at ANSTO, but an instrumental option for a high-throughput cross-discipline spectroscopy is urgently needed. Fortunately, it is fairly straightforward to add this type of option to an existing spectrometer that will broaden its user-base from specialised applications in physics to more general applications in physics, chemistry, materials-science and biology. This additional option provides a totally new way for Australian scientists to study atomic and molecular motions.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Southern Cross University

LE0989952 Prof BD Eyre; A/Prof PL Harrison; Prof JK Vanclay; Dr L Davison; Dr ED Burton; Dr JM Oakes

Approved Project Title **A Continuous Flow-Wet Chemical Oxidation- Isotope Ratio Mass Spectrometer for Environmental Research**

2009 : \$ 220,000

Primary RFCD 2599 OTHER CHEMICAL SCIENCES

Partner Organisations & Collaborating Organisations

Southern Cross University

Administering Organisation Southern Cross University

Project Summary

The proposed Continuous Flow-Wet Chemical Oxidation- Isotope Ratio Mass Spectrometer (CF-WCO-IRMS) facility will be the first in Australia, and as such will allow ground-breaking research to be undertaken resulting in advances in a variety of fields. As such, this system will significantly enhance many core research programs at Southern Cross University and enhance our ability to deliver high quality research in the National Research Priority Area of An Environmentally Sustainable Australia with priority goals water- a critical resource, responding to climate change and variability, overcoming soil loss, salinity and acidity and sustainable use of Australia's biodiversity.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of New South Wales

LE0989147 Prof IW Dawes; A/Prof SC Schuster; Prof RJ Trent; Prof RJ Henry; Prof RJ Scott; Prof IT Paulsen; A/Prof KS Gibb; Dr T Thomas; Prof SL Kjelleberg; Prof R Cavicchioli; Prof BA Neilan; Prof JK Reichardt; Em/Prof PL Bergquist; Prof HW Stokes; A/Prof MR Gillings; Dr PM Giffard; Prof PR Dunkley; Prof PS Foster

Approved Project Title **Advanced high throughput genomics facility for biological, medical, agricultural, environmental and evolutionary research**

2009 : \$ 950,000

Primary RFCD 2702 GENETICS

Partner Organisations & Collaborating Organisations

The University of New South Wales

Southern Cross University

The University of Sydney

Macquarie University

The University of Newcastle

Charles Darwin University

Administering Organisation The University of New South Wales

Project Summary

Infrastructure requested will expand the capacity of researchers in NSW/NT to undertake environmental, medical and evolutionary studies using state-of-the-art technologies based on the recent advances in DNA sequencing analyses. It will ensure the retention of leading researchers in the exciting areas of genomics and Systems Biology and make a significant contribution to biomolecular research in medicine, agriculture and environmental biology, thereby providing major benefits to the wider community. The application will enhance existing genomic technologies by substantially increasing the scope of experiments that can be performed leading to important advances in gene discovery.

LE0989567 Prof JJ Gooding; Prof R Amal; Dr P Thordarson; Prof AN Buckley; Prof MA Green; Dr GJ Conibeer; Dr E Cho; Dr D Koenig; Prof RP Burford; Prof SM Thurgate; Prof MJ Crossley; Dr W Yang; Dr J Downes

Approved Project Title **State of the Art Surface Characterisation Facility for the Sydney Basin**

2009 : \$ 500,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of New South Wales

Macquarie University

The University of Sydney

Administering Organisation The University of New South Wales

Project Summary

Many of the grand challenges of our time, including finding alternative sources of energy, maximizing our current supply of natural resources, identifying and treating pollution in general, and in water in particular, and developing therapies and biomaterials that enable the personalisation of therapies to each individual are being solved using developments in the molecular sciences. Pivotal to the success of such research is to understand materials and surfaces at the molecular level. The request is to purchase surface analysis instrumentation which will dramatically enhance the ability of scientists around Australia understand how to develop solutions to these grand challenges.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989476 Prof RH Grzebieta; Prof AM Williamson; Prof MJ Hoffman; A/Prof AS McIntosh; A/Prof MM Attard; Dr M Bambach; Dr C Caponecchia; Ms R Friswell; Dr J Hatfield; Dr RF Job; Ms P Albany; Dr D Friedman; Mr I Cameron

Approved Project Title **Rollover Crash Research Infrastructure Capacity Building**

2009 : \$ 300,000

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Partner Organisations & Collaborating Organisations

The University of New South Wales

Monash University

NSW Centre for Road Safety

Motor Accidents Authority

Centre for Injury Research USA

Office of Road Safety WA

Administering Organisation The University of New South Wales

Project Summary

Around 1 in every 3 vehicle occupants die in a crash where the vehicle rolls over. This crash mode also accounts for around 25% of spinal injuries and cost the community around \$2.5 billion annually. There are no rollover crash standards or consumer crash tests. The equipment purchased will be used to develop a rollover crashworthiness test protocol that can be adopted by consumer testing groups, to understand the role of fatigue in precipitating rollover crashes, and to develop a driver fatigue metric. It is estimated this research will result in saving around 150 lives, reducing serious spinal and head injuries and save the Australian community around \$800 million per annum.

LE0989946 Prof M Guilhaus; Prof DB Hibbert; Prof LD Field; Prof BA Messerle; Prof JJ Gooding; Prof MM Harding; Prof C Barner-Kowollik; A/Prof MJ Monteiro; Dr AS Micallef; Dr MR Whittaker

Approved Project Title **High Resolution LC/MS and MALDI for Molecular and Macromolecular Characterisation**

2009 : \$ 357,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Queensland

University of Karlsruhe

Administering Organisation The University of New South Wales

Project Summary

The provision of high-resolution and matrix assisted laser desorption ionisation mass spectrometers configured for the molecular and macromolecular research of high quality research groups will lead to earlier and better fundamental discoveries that are directed at important practical developments in medicine, biotechnology, nanotechnology, light-energy harvesting, polymer materials and sensors. These include anticancer agents, nanodevices for drug delivery, better polymers with more energy efficient industrial processes, bioactive molecules for industrially important nitrogen fixation and many more.

LE0989760 Prof AR Hamilton; Dr AP Micolich; Prof R Newbury; Dr OV Klochan; Dr T Martin; Dr L Taskinen

Approved Project Title **Upgrading Australia's highest magnetic field facility for high speed measurements of quantum devices at cryogenic temperatures**

2009 : \$ 100,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The University of New South Wales

Administering Organisation The University of New South Wales

Project Summary

Electronic devices are a trillion dollar industry, and underpin our information-based society. Research at liquid helium temperatures (below -270 °C) is an essential step in developing new electronic devices, and has resulted in breakthroughs such as the laser, the high capacity hard disc drive, and the high speed chips used for satellite telecommunications. This proposal will upgrade Australia's existing capabilities to allow ultra-high speed measurements of advanced nanoscale devices at temperatures close to absolute zero, and in magnetic fields up to 17 Tesla, allowing Australia to continue play a leading role in the development of quantum technologies.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989858 Dr SS Li; Dr N Valanoor; Prof C Zhang; Prof MA Green; Dr R Zheng; Dr D Yu; Prof AB Yu; Prof Y Zhao; Prof CC Sorrell; A/Prof AV Pan; Dr J Horvat; A/Prof AJ Ruys; Dr Y Liu; Dr MZ Quadir; Dr JZ Wang; Dr Y Zhang

Approved Project Title **Fabrication Facilities of Atomic-Scale and Nanostructured Materials for the Development of Novel Devices, Sensors, and Biomedical Components**

2009 : \$ 857,230

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of New South Wales

University of Wollongong

Australian Nuclear Science & Technology Organisation (ANSTO)

The University of Sydney

Administering Organisation The University of New South Wales

Project Summary

Australia's energy, mining, metallurgical, defence, biomedical 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 will be largely driven by advances in materials. The installation of the proposed facilities will add a new dimension to high-level research performance and significantly enhance the capability for the development of advanced materials and biomedical components in Australia. The continual development of advanced material and biomedical components will potentially provide a sustainable means for meeting the increasing global challenge for the industries.

LE0989541 Prof BA Messerle; Prof TP Davis; Prof LD Field; Prof C Rae; A/Prof M Stenzel; Dr GE Ball; Dr JM Hook; Prof Dr T Maschmeyer; Prof CJ Kepert; Dr JP Mackay; Prof PW Kuchel; Prof G Otting; Mr JV Hanna

Approved Project Title **High Field Solid State and Multinuclear NMR Spectrometer for Structure/Function Analysis of Materials**

2009 : \$1,000,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of New South Wales

The University of Sydney

The Australian National University

Australian Nuclear Science & Technology Organisation (ANSTO)

Administering Organisation The University of New South Wales

Project Summary

Projects requiring the proposed infrastructure are aligned with two of the National Research Priorities. The research will lead to the development of novel materials, polymers and drugs, in particular nanoporous molecular frameworks, as well as reactive catalysts. The understanding of protein structure, disease and metabolic pathways which will be established using the proposed equipment will contribute to the priority area 'Promoting and Maintaining Good Health'. In addition, the new equipment will extend capabilities and postgraduate training in chemistry, nanotechnology, and biomedicine (the priority area of 'Frontier Technologies for Building and Transforming Australian Industries').

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989680 Prof CC Sorrell; A/Prof DB Gore; Prof TD Waite; Prof RP Burford; Prof DB Hibbert; Dr IT Graham; A/Prof ID Goodwin; Prof M Westoby; Dr GC Hose; Prof N Kanawati; Dr MR Leishman

Approved Project Title **Interuniversity Elemental and Structural Analytical Facility**

2009 : \$ 300,000

Primary RFCD 2603 GEOCHEMISTRY

Partner Organisations & Collaborating Organisations

The University of New South Wales

Macquarie University

Administering Organisation The University of New South Wales

Project Summary

The items in this proposal will form the first stage of a larger facility for Elemental and Structural analytical programs in materials engineering and the natural sciences. The vision is to create an analytical facility which will have at its core and at the outset true collaboration leading to great national benefit. The equipment will be available via on-line access management allowing equitable and transparent access for users from multiple institutions. The resulting facility will complement existing microstructural capabilities and networks and will be open for all researchers and collaborators to use, further enhancing the national benefit.

LE0989347 Prof CG Tinney; Prof M Colless; Prof TR Bedding; Dr L Kiss; Prof KC Freeman; Prof JE Norris; Prof GS Da Costa; Prof JC Lattanzio; Dr BD Carter; Dr SC Marsden

Approved Project Title **CYCLOPS - A Better Way to Find Extrasolar Planets**

2009 : \$ 350,000

Primary RFCD 2401 ASTRONOMICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of New South Wales

Anglo-Australian Observatory

The University of Sydney

The Australian National University

Monash University

Administering Organisation The University of New South Wales

Project Summary

The primary scientific driver for this new facility is the search for planets orbiting other stars. Australian astronomers, and the Anglo-Australian Telescope, have played a leading role in this new frontier for astronomy, detecting 25 of the 250-odd extrasolar planets known to orbit nearby stars. The CYCLOPS project brings together a team of leading Australian astronomers to build on this track record with a new facility that further advances Australia's capabilities in both this field, and several other high-profile astronomical endeavours: including the study of seismology in stellar interiors, the detailed measurement of elemental abundances in stars throughout our Galaxy, and the mapping of spot features on the surfaces of stars.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Newcastle

LE0989105 Prof RJ Aitken; A/Prof A McCluskey; Dr MA Baker; Dr NM Verrills; A/Prof M Maeder; Dr X Zhou; Dr EA McLaughlin; Dr B Nixon; Dr SD Roman; Prof RJ Rose; A/Prof RH Dunstan; Prof CP Grof; Prof R Smith; Prof P Gibson; Prof AL Jones; Prof MB Calford; Prof KT Jones; Dr RF Thorne; Prof PR Dunkley; Prof PS Foster; Prof LK Ashman; Prof GF Burns; Dr PW Dickson; Prof JA Rostas; Prof RJ Scott; Dr PA Tooney; A/Prof PM Hansbro; A/Prof PA Moscato; A/Prof PC Dastoor; Dr PJ Lewis; Dr P Stanton; A/Prof DM Robertson

Approved Project Title **An Advanced Mass Spectrometry Facility for Applications in Proteomics and Organic Chemistry**

2009 : \$ 495,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Newcastle

Hunter Medical Research Institute

Prince Henry's Medical Research Institute

ARC Centre of Excellence in Biotechnology and Development

Administering Organisation The University of Newcastle

Project Summary

Biomolecular research and research training, in which proteomics is core, has become a critical component of post-industrial development in the Hunter region. Development of a cutting edge proteomics facility will benefit a research community comprising over 50 researchers and 150 undergraduate students significantly enhancing their research productivity and translation of outcomes in areas of national importance. These include understanding the impact of the environment on plant and animal development, pest animal control, development of new biotechnology tools, new drugs and new methods for the detection of narcotics and explosives.

LE0989084 Prof KT Jones; Dr EA McLaughlin; Prof RJ Aitken; Prof RJ Rose; Em/Prof JW Patrick; Adj/Prof CE Offler; A/Prof DW McCurdy; Prof LK Ashman; Prof GF Burns; A/Prof DF van Helden; Dr NM Verrills; Dr B Nixon; Dr SD Roman; A/Prof Y Ruan; Dr RF Thorne; Prof MB Calford

Approved Project Title **Confocal Laser Scanning Microscopy for Live Cell Imaging**

2009 : \$ 275,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Newcastle

Administering Organisation The University of Newcastle

Project Summary

The University of Newcastle has invested heavily in its biological and life sciences to create a research nexus focusing on national research priorities in biotechnology and environmental protection. The Live Cell Imaging platform will be utilized by scientists researching such strategically important areas including developmental biology, intracellular signalling cascades, cell cycle dynamics, plant development and microbiology. Moreover, this component of the University's research portfolio plays a major role in the postgraduate training of young Australian scientists who will, in turn, fuel future developments in both the life sciences and biotechnology industries.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989861 Prof EH Kisi; Dr SW Donne; Dr VJ Keast; A/Prof AM Brichta; Prof RE Melchers; Adj/Prof CE Offler; Prof J O'Connor; Prof SO Moheimani; Em/Prof JW Patrick; A/Prof DF van Helden; A/Prof BV King; Prof GM Evans; A/Prof RH Dunstan; Dr GR MacFarlane; A/Prof Y Ruan; Dr SM Roselli; Dr M Lin; Prof CP Grof; Dr S Frisia; Dr R Lim; Dr HO Sugo; Dr JS Forrester; Dr OP Buzzi; Dr AJ Fleming; A/Prof EJ Wanless; Dr CI Holdsworth; Dr RN Drysdale; A/Prof SG Fityus; A/Prof DW McCurdy; Dr D Zhu; Dr CJ Fell; Prof B Moghtaderi; Dr AJ McFarlane; Dr PJ Lewis

Approved **Electron Microscopes for Nanometer-Scale Imaging/Microanalysis in the Materials,**
Project Title **Biological, Physical, Engineering and Chemical Sciences**

2009 : \$ 650,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Newcastle
BHP Billiton - Newcastle Technology Centre
CSIRO - Energy Technology
Nyrstar

Administering Organisation The University of Newcastle

Project Summary

Electron microscopes have contributed to many of the most significant discoveries and technological advances of the last 6 decades. High resolution transmission and scanning electron microscopes have become essential research infrastructure in internationally competitive materials science, biology, bio-medical science, physics, chemistry and a broad range of engineering disciplines. This capability is not currently available in the Newcastle, Hunter, Central and Lower North Coast and New England regions. This proposal is aimed at satisfying the considerable demand for high resolution microscopy in these areas leading to high quality research outcomes across 3 National Research Priorities and a strong contribution to research training.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Sydney

LE0989648 Prof BJ Eggleton; Dr DJ Moss; Prof B Luther-Davies; Prof MW Austin; Prof J Bland-Hawthorn; Prof SH Kable; Prof J Canning; Dr PG Tuthill; Prof RC McPhedran; Prof SC Fleming; Dr MC Large; Dr SD Jackson; Dr C Monat; Dr C Grillet; Dr F Luan; Dr JA Bolger; Dr C Karnutsch; Dr S Madden; Prof I Cosic; Dr E Pirogova

Approved Project Title **Optical test-bed facility for mid infrared components for sensing, imaging and astrophotonics**

2009 : \$ 350,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

The University of Sydney

RMIT University

The Australian National University

Administering Organisation The University of Sydney

Project Summary

This test facility will enable Australian researchers to validate optical components and technologies at wavelengths from 2.5 to 20 microns, that are crucial for a wide range of applications including biophotonics, sensing, imaging, defense, and astro-photonics. Technologies related to the Mid IR are expected to have a significant impact on quality of life and global economy. It will enable Australian researchers to achieve a major impact in many areas of Mid IR fundamental and applied science as well as industry sectors such as sensing, biophotonics, defence, health, bio-security and imaging.

LE0989859 Dr AS Jones; Prof AM Darendeliler; Prof MV Swain; Dr D Traini; Dr PM Young; Prof DR Richardson; Dr Q Li; A/Prof I Einav; Dr JM Cairney; Prof CR Murphy; Prof SP Ringer; Prof MJ Seibel; Dr H Zhou; Dr IM Ramzan; Prof PR Munroe; Prof M Archer; Dr S Hand; Dr Y Zhang; Prof BK Milthorpe; A/Prof X Wang; A/Prof AF Masters

Approved Project Title **A Multi-Resolution X-ray Microtomography Facility (NanoCT & MicroCT) for Non-Destructive 3D Characterisation**

2009 : \$1,000,000

Primary RFCD 2705 ZOOLOGY

Partner Organisations & Collaborating Organisations

The University of Sydney

The University of New South Wales

University of Wollongong

Administering Organisation The University of Sydney

Project Summary

X-ray microtomography platforms are applicable to a wide diversity of research across many of the national research priority areas. The research outlined will provide insights into bone cancer and osteoporosis, promote breakthroughs in the understanding of tumour biology and drive new developments in novel biomaterials, all of which have significant national health benefits. In dentistry, research supported by this instrumentation will provide Australians with improvements to their dental health. Furthermore applications to industrial materials are providing Australian industries with better characterisation of their products that is leading to improved export performance and consequent improvement in Australia's balance of trade.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989744 Prof NJ King; Dr K Gaus; Prof MA Vadas; Prof GE Grau; Prof LM Khachigian; Prof NH Hunt; Prof IL Campbell; Prof W Weninger; Prof J Black; Prof WJ Britton; Prof DR Richardson; Prof CL Geczy; Prof BD Fazekas de St Groth; Prof PW Gunning; Prof W Jessup; Prof RS Mason; Prof RI Christopherson; Prof G Halliday

Approved Project Title **7-laser BD LSR-II and Cellomics ArrayScan VTi, to enhance capability and throughput for the NSW Advanced Cytometry Facility**

2009 : \$ 500,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

The University of Sydney

The University of New South Wales

Administering Organisation The University of Sydney

Project Summary

The scientific advances that will be possible with the acquisition of these complementary cutting-edge instruments will enhance the research outputs of all investigators using it. Projects where investigation of either suspended or adherent live cells is used to elucidate basic life processes of eukaryotic cells across all species of animals, including the investigation of both normal and abnormal function, will be immeasurably enhanced by both the qualitative and quantitative statistical information about these processes that is generated by this instrumentation. This in turn will inform new approaches to improve and maintain the health of both humans and animals.

LE0989703 Dr SG Solomon; Prof DG Allen; A/Prof JW Morley; Dr IS McGregor; Prof RF Westbrook; Prof B Dreher; Prof RA Dampney; Dr E Arabzadeh; Prof NJ King; Prof NH Hunt; Dr K Keay; Dr W Phillips; Dr K Cullen; Dr C Leamey; Dr C Koepl; Dr DA Protti

Approved Project Title **Multiphoton microscope for cellular imaging in live animals**

2009 : \$ 500,000

Primary RFCD 3207 NEUROSCIENCES

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 proposed facility will for the first time allow scientists across Sydney to monitor cell function in intact brain and muscle tissues. The novel optical approach combines fluorescent markers with sophisticated microscopy. The presence of this facility will allow Australian scientists to design new approaches to fundamental biological questions concerning cellular function within the normal environment. In addition this facility will allow PhD and post-doctoral scientists to train and have access to a rapidly developing and cutting edge approach to biological problems.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

University of Technology, Sydney

LE0989506 Prof LC Botten; A/Prof MJ Ford; Dr CG Poulton; Dr A Rahmani; Prof SW Armfield; A/Prof S Kuyucak; Dr GF Lewis; Prof RC McPhedran; A/Prof D Muller; Prof L Radom; Prof HA Abbass; Dr GE Ball; Dr RJ Bursill; Prof MH England; Dr R Khanna; Prof E Leonardi; Prof AJ Pitman; Prof MR Wilkins; Prof KP Esselle; Prof S Ranganathan; A/Prof MJ Steel; A/Prof FA Henskens; Prof EI von Nagy-Felsobuki; Prof TR Marchant

Approved Project Title **A high performance computing cluster and storage for the INTERSECT Consortium of NSW**

2009 : \$ 500,000

Primary RFCD 2506 THEORETICAL AND COMPUTATIONAL CHEMISTRY

Partner Organisations & Collaborating Organisations

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

Administering Organisation University of Technology, Sydney

Project Summary

The installation of this new supercomputing facility is an important addition to the nation's foundation research infrastructure. Of particular importance to research groups in NSW is the much needed boost in computational research and research training capacity that it will provide, enabling world leading research teams to continue their ground breaking work in an increasingly competitive international environment. Much of the research to be supported lies in areas of national priority, including frontier technologies and Australian environmental sustainability.

LE0989957 Prof AS Mowbray; Prof GW Greenleaf; Prof SK Blay; Prof AC Byrnes; Prof RG Rayfuse; Prof MA Adams; Prof DR Rothwell; Prof K Rubenstein; Prof GD Triggs

Approved Project Title **The International & Humanitarian Law Library - A global dimension in Australian legal research infrastructure**

2009 : \$ 150,000

Primary RFCD 2801 INFORMATION SYSTEMS

Partner Organisations & Collaborating Organisations

University of Technology, Sydney
The University of New South Wales
University of Western Sydney
Department of Foreign Affairs and Trade
The Australian National University
The University of Sydney

Administering Organisation University of Technology, Sydney

Project Summary

All researchers in international and humanitarian law in Australian Law Schools will use this infrastructure to improve their research. So will similar researchers from Universities worldwide, enhancing Australia's reputation in this field. Australia's Department of Foreign Affairs and Trade, and other government agencies involved in international law, co-operation and trade, will obtain similar benefits from resources not available within government, assisting the Australian Government's moves toward greater involvement in international institutions. Researchers from non-government organisations with international engagements will benefit from free access, as will all Australians who wish to better inform themselves in these fields.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989920 A/Prof CB Whitchurch; Prof EJ Harry; A/Prof MR Phillips; A/Prof MJ Ford; Prof JP Dalton; A/Prof PJ Ralph; Dr MA Doblin; A/Prof NC Smith; Dr N Firth; Prof J Trehella; A/Prof GC Cox; A/Prof FC Braet; A/Prof DA Carter; Dr TP Newsome; Prof NE Dixon; Prof MJ Walker; Dr JM Mackenzie; Dr E Hanssen; Prof L Tilley; A/Prof J Mak; Dr RM Murphy; Dr MT Ryan; Prof DG Stephenson; Prof DL Vaux; A/Prof C Tang; Prof PR Fisher; Dr AR Gendall; A/Prof SG Crewther; A/Prof TA Smith; Prof RM Robins-Browne; Dr EL Hartland

Approved Project Title Microbial and Cellular Imaging and Analysis Facility

2009 : \$ 750,000

Primary RFCD 3210 CLINICAL SCIENCES

Partner Organisations & Collaborating Organisations

University of Technology, Sydney

La Trobe University

The University of Melbourne

The University of Sydney

University of Wollongong

Administering Organisation University of Technology, Sydney

Project Summary

The Microbial and Cellular Imaging and Analysis Facility will rapidly establish itself as one of Australia's premier science facilities. It will provide the capacity to investigate the structure and molecular dynamics of viruses and microbial, human, animal and plant cells with unprecedented high resolution in both pure and applied research settings, guided by Australia's leading experts in many research strengths. This facility addresses a current unmet need for scientists in this country and will provide cutting-edge technologies to Australian researchers so they can better detect, understand, and treat human, animal and plant diseases and the environmental impact of climate change.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

University of Western Sydney

LE0989831 Prof RT Dean; Ms CA Hope; Mr JO Davis

Approved Project Title **The Australian Music Navigator: research infrastructure for discovering, accessing and analysing Australia's musical landscape**

2009 : \$ 205,000

Primary RFCD 4101 PERFORMING ARTS

Partner Organisations & Collaborating Organisations

University of Western Sydney

Edith Cowan University

Australian Music Centre Ltd

Administering Organisation University of Western Sydney

Project Summary

The aim of the Australian Music Navigator initiative is to enhance the research, analysis, discoverability and understanding of Australian art music practice through the development of an innovative online facility. In addition to enabling access to digital sound and score objects, the facility will allow for sophisticated explorations of the rich inter-relationships between creators, performs, works, manifestations, events, genres, venues, awards and research. This infrastructure will ensure the prominence and accessibility of Australian music as a subject for research, and thereby contribute to our collective ability to engage with and understand our musical heritage.

LE0989986 Dr GS Kannangara; Dr AS Milev; Prof J Bartlett; Prof PA Williams; Prof WS Price; Dr NH Tran; Dr GR Dennis; Dr RA Shalliker; Mr G Porter; Prof JW Cairney; A/Prof IC Anderson; Dr Y He; Prof EM Kennedy; Dr SC George; Dr GM Moran; Dr JA Scott; Dr DB McNevin; A/Prof Y Chen; Dr MA Wilson

Approved Project Title **Hybrid Fourier Transform Dispersive Raman Micro-Spectrometer**

2009 : \$ 230,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

University of Western Sydney

The University of New South Wales

The University of Newcastle

Macquarie University

University of Canberra

CSIRO - Petroleum Resources

The Australian National University

Administering Organisation University of Western Sydney

Project Summary

This facility will be used in a wide range of existing and new research projects in government priority areas such as the development of new materials, frontier technologies for building and transforming existing industries, better understanding of diversity and functioning in mycorrhizal and other fungi in forest soils and plant roots and developing new characterisation methods for forensic investigations. The proposed equipment aims to provide outstanding opportunities for the training of research students, expanding research in the fields of materials, minerals, geological, environmental and forensic science enabling to maintain Australia's lead and competitiveness in cutting edge research and technology.

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University of Wollongong

LE0989077 Prof NE Dixon; Prof G Otting; Prof PM Curmi; Prof MJ Walker; Dr JL Beck; A/Prof MA Ranson; Dr JA Aquilina; Prof MR Wilson; Dr MG Casarotto; Dr C Freeman; Prof CR Parish

Approved Project Title **Regional Facility for Real Time Analysis of Molecular Interactions**

2009 : \$ 225,600

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

University of Wollongong
The Australian National University
The University of New South Wales

Administering Organisation University of Wollongong

Project Summary

The ARC Facility for the Analysis of Biomacromolecular Interactions at the University of Wollongong and ANU serves many research groups working at the interface of chemistry and biology with the ultimate aim of drug target identification and drug development. New state-of-the-art instrumentation will enhance their capabilities and enable new activities. Specifically, the new instruments will facilitate characterization of macromolecular complexes and enable rapid and precise study in real time of the rates at which molecules interact, under many different experimental conditions. It will strengthen existing collaborations among the partner institutions and provide essential infrastructure for drug development projects.

LE0989078 Dr TW Mitchell; Dr SJ Blanksby; Dr JL Beck; Prof X Huang; A/Prof PL McLennan; Prof W Jessup; Dr K Gaus; Prof MD Willcox; Prof RJ Truscott; Prof LH Storlien; Prof ID Caterson

Approved Project Title **Unique, state-of-the-art lipidomics infrastructure**

2009 : \$ 400,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

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

Administering Organisation University of Wollongong

Project Summary

The new technologies provided through this grant will significantly enhance our understanding of lipids and their role in normal cell biology and disease. These new insights will be vital in improving our understanding of lipid-related disorders such as obesity, type 2 diabetes and cardiovascular disease and helping to improve their treatment and prevention.

LE0989492 Prof E Pereloma; Dr MR Barnett; Prof HK Liu; Prof PD Hodgson; Dr AI Minett; Prof KA Tieu; Prof J Norrish; Prof RJ Dippenaar; Prof BN Indraratna; Dr D Wexler; Dr FJ Barbaro; Dr KK Konstantinov; A/Prof ZY Jiang; A/Prof G Wang; Prof DP Dunne; Dr N Stanford; Dr A Calka; Dr H Beladi; Dr ZP Guo; Dr AA Gazder; Dr DJ Phelan; Dr BF Rolfe

Approved Project Title **Dynamic Texture Measurement Facility**

2009 : \$ 350,000

Primary RFCD 2499 OTHER PHYSICAL SCIENCES

Partner Organisations & Collaborating Organisations

University of Wollongong
Deakin University
BlueScope Steel Limited

Administering Organisation University of Wollongong

Project Summary

A texture goniometer is an advanced tool for texture characterisation of steels, light alloys, nanomaterials, superconductors and minerals. The ability to conduct dynamic texture measurements will significantly enhance the effectiveness of four material-based research institutes at the University of Wollongong and at Deakin University, 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 and in regional South-West Victoria.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989804 Prof KA Tieu; Prof GM Spinks; Prof HR Brown; Prof E Pereloma; Prof PK Yariagadda; A/Prof ZY Jiang; A/Prof G Alici; Dr D Li; Dr C Yan; A/Prof FG De Boer; Dr J Chen; Dr ZP Guo; Dr KK Konstantinov; Prof DJ Hargreaves; Dr T Vodenitcharova; Dr Y Zhao; Dr S Zhou; Dr W Li; Dr C Lu; Dr PB Kosasih; Dr H Zhu

Approved Project Title **A Universal Nano Tribometer for Surface and Thin Film Characterisation**

2009 : \$ 150,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

University of Wollongong
Queensland University of Technology
The University of New South Wales
Charles Darwin University

Administering Organisation University of Wollongong

Project Summary

The proposed infrastructure will be of major benefit to a large number of ARC funded research projects involving characterisation of materials at four universities UOW, QUT, UNSW and CDU. The project will extend the research capability of the participating researchers and facilitate innovative projects and new research direction in advanced materials processing in the nano/micro scale. This in turn will lead to improved international competitiveness of Australian industry.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Victoria

La Trobe University

LE0989069 Prof PL Dyson; A/Prof JC Devlin; Dr R Makarevich; A/Prof CL Waters; A/Prof FW Menk; Prof IM Reid; Prof RA Vincent; Prof DA Gray

Approved Project Title **A New Digital Radar for Studies in Solar-Terrestrial and Atmospheric Physics**

2009 : \$ 450,000

Primary RFCD 2606 ATMOSPHERIC SCIENCES

Partner Organisations & Collaborating Organisations

La Trobe University
The University of Newcastle
The University of Adelaide

Administering Organisation La Trobe University

Project Summary

Australia is a world leader in the development of High Frequency (HF) radar surveillance systems, such as JORN (Jindalee over-the-horizon radar). However, Australia's ability to support these operations and remain a leader in these fields depends on its capacity to nurture expertise and train new personnel in these areas. The new HF radar system will play a crucial role in this respect, providing (i) high-level training in radar technology and associated science, (ii) a test bed for the development of new instrumental and data analysis techniques, (c) new information on the source of ionospheric perturbations that can affect the performance of JORN, and (d) data important for Australia's space weather prediction community, via IPS (Ionospheric Prediction Service) Radio and Space Services.

LE0989915 Dr CQ Tran; A/Prof AG Peele; Prof KA Nugent; A/Prof AY Nikulin; Dr J Thornton

Approved Project Title **X-ray Nano-scale Coherence Facility**

2009 : \$ 127,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

La Trobe University
The University of Melbourne
Monash University
Defence Science & Technology Organisation (DSTO)

Administering Organisation La Trobe University

Project Summary

Australia is rapidly developing into a world leader for x-ray imaging. This position has been supported by leading research groups and more recently by the development of the Australian Synchrotron. This project will fill a vital missing link in the experimental capability of Australian researchers - a flexible facility that can provide a nanoscale x-ray source. This enhanced capability will lead to new developments in coherent imaging methods. These new methods will be used in the study of biological systems, leading to better drug design as well as in the study of materials, leading to stronger and lighter components.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Monash University

LE0989123 Prof Y Cheng; Prof BC Muddle; Prof GP Simon; Prof YS Estrin; Prof C Li; Dr H Wang; Prof GB Schaffer; A/Prof I Low; Dr MR Barnett; A/Prof L Kong; Dr C Wen; Dr BF Rolfe; Mr NA Stone; Dr S Lathabai; Dr MA Gibson; Dr RN Lumley; Dr AJ Seeber; Prof L Edwards; Dr PA Walls

Approved Project Title Spark Plasma Sintering (SPS) Facility for Advanced Materials Processing

2009 : \$ 575,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

Monash University

Deakin University

The University of Queensland

Curtin University of Technology

CSIRO - Manufacturing and Infrastructure Technology

Australian Nuclear Science & Technology Organisation (ANSTO)

Administering Organisation Monash University

Project Summary

The establishment of the first Spark Plasma Sintering (SPS) facility would significantly enhance Australia's capacity in manufacturing of advanced materials, especially the more sophisticated and specialized materials, which is a National Research Priority. This facility will benefit a large number of researchers and projects in Australia's premier research organisations and will also meet the needs of organisations outside the consortium. It will allow Australian researchers to remain at the leading edge of research and enhance collaborations in advanced materials nationwide. The successful outcomes of these activities will underpin the advancement in many areas of research and technology developments in the country.

LE0989471 Dr JS Forsythe; Dr AJ O'Connor; Prof GB Garnier; Prof GW Stevens; Dr GA Thouas; Prof JS Van Deventer; Dr W Shen; Dr SL Gras; Dr N Birbilis; Dr Q Chen; Dr JL Provis; Prof GP Simon; A/Prof GV Franks; Dr RA Caruso; Dr GM Forde; Prof WA Morrison; Prof MK Horne; Dr PG Farlie

Approved Project Title Facility for innovation in structural biomaterials engineering

2009 : \$ 300,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Partner Organisations & Collaborating Organisations

Monash University

The University of Melbourne

Administering Organisation Monash University

Project Summary

Biomaterials are used in a diverse range of environments that impact on the way that all Australians live. The Facility for Innovation in Structural Biomaterials Engineering will greatly assist researchers to undertake cross-disciplinary projects aimed at improving human health eg. smart materials that assist stem cell therapies for treating deafness and spinal cord injuries, as well the way we live eg. more durable building materials for a sustainable national infrastructure. The facility will help Australia remain at the forefront of these high priority areas and see both individuals and industry benefit from advanced biomaterial products.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989504 A/Prof MJ Stone; A/Prof PR Gooley; Dr MJ Scanlon; Prof SJ Langford; Dr JA Wilce; Prof F Separovic; Dr KL Tuck; Dr SP Bottomley; Prof JC Whisstock; Prof EC Reynolds; Prof PJ Scammells

Approved Project Title **Melbourne Biomolecular NMR Network**

2009 : \$1,400,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisations & Collaborating Organisations

Monash University

The University of Melbourne

Administering Organisation Monash University

Project Summary

The Melbourne Biomolecular Nuclear Magnetic Resonance (NMR) Network will support a broad range of basic research activities with long-term benefits for diagnosis, treatment and prevention of numerous diseases. Metabolomics studies will identify human disease markers and characterise the physiological consequences of pharmaceutical intervention. Reverse chemical genetics approaches will identify new drug candidates and reveal novel mechanisms for regulating the activities of target proteins. Structural and dynamics studies will reveal molecular details of drug/candidate action and provide guidance for rational improvements. Overall, the planned research activities will have significant benefits for human health.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

RMIT University

LE0989615 A/Prof J Du Plessis; Prof P Mulvaney; Prof DG McCulloch; A/Prof A Mitchell; Dr AS Holland; Dr K Kalantar-zadeh; Prof SK Bhargava; Dr V Bansal; Prof PJ Coloe; Prof RA Shanks; Prof AB Holmes; A/Prof JE Sader

Approved Project Title **Melbourne Platform for Surface Characterisation of Structured Materials**

2009 : \$ 300,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

RMIT University

The University of Melbourne

Administering Organisation RMIT University

Project Summary

The Australian economy is gradually expanding its manufacturing base through the development of the nanotechnology and biotechnology sectors. This will lead to production of a more diverse range of elaborately transformed goods. A key contributor to these export opportunities will be the nanotechnology sector since at the present time no country has a real nanotechnology based economy and there are many niche markets available for smaller countries such as Australia. This proposal helps to build quality control and characterisation infrastructure that will facilitate prototyping and design of nanoscale devices and sensors for next generation manufacturing.

LE0989726 A/Prof A Mitchell; Dr K Kalantar-zadeh; Dr AS Holland; Dr JG Partridge; Mr G Kostovski; Dr TG Nguyen; Dr PR Stoddart; Prof BJ Eggleton; Dr C Monat; Dr C Grillet; Dr C Karnutsch; Dr G Rosengarten; Dr DN Neshev

Approved Project Title **Nanophotonic and Microfluidic Integration Facility: a Platform for Optofluidics**

2009 : \$ 250,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

RMIT University

Swinburne University of Technology

The University of Sydney

The University of New South Wales

The Australian National University

Administering Organisation RMIT University

Project Summary

Emerging 'lab on a chip' technology promises to provide low-cost, mass produced platforms for monitoring and processing of environmental and biological samples (eg. water quality and early cancer detection). These essentially fluidic platforms will require integrated photonic components to provide the vast array of optical interrogation options that are used in all modern laboratories. The proposed facility will enable Australian researchers to effectively integrate nano-photonic structures with engineered micro-fluidics into a single optofluidic chip. This will bring researchers in photonics and microfluidics together and will provide platforms supporting support biomedical and environmental and even fundamental physics projects.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Swinburne University of Technology

LE0989700 Prof J Thomas; Prof DL Meredyth; Mr D Whitehead; Prof RE Tiffen; A/Prof JD Spoehr; Prof JA Walter; Prof IB Katz; Dr AN Lynch

Approved Project Title **The Australian Policy Online Full-Text Research Repository and Thematic Gateways**

2009 : \$ 175,000

Primary RFCD 3602 POLICY AND ADMINISTRATION

Partner Organisations & Collaborating Organisations

Swinburne University of Technology

The University of Sydney

The University of Adelaide

Monash University

The University of New South Wales

Administering Organisation Swinburne University of Technology

Project Summary

By bringing together the research outputs of over 160 member centres and institutes, as well as selected material from government and other sources, Australian Policy Online (APO) makes a significant contribution to the national research effort across all National Research Priorities - environmental sustainability, promoting and maintaining good health, frontier technologies and safeguarding Australia - and to the development of well-informed public policy. This project will increase the value of APO by deepening its coverage of preventative health, planning and the environment, and citizenship; broadening its collection of research material; and offering new resources for researchers.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Melbourne

LE0989341 Prof F Caruso; Prof K Hourigan; Prof GW Stevens; Prof T Sridhar; Prof SJ Kent; Mr A Fouras; A/Prof GG Qiao; A/Prof DE Dunstan; Dr GA Thouas; A/Prof SB Hooper; Dr AJ O'Connor; Dr AP Johnston; Dr BM Stadler; A/Prof RG Evans; Dr SL Gras; Dr KM Denton; Dr JT Pearson; Dr GK Such; Dr A Blencowe; Dr MJ Kitchen; Dr KK Siu

Approved Project Title **Advanced NanoBiomaterials Imaging Facility**

2009 : \$ 690,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

The convergence of nanotechnology with biotechnology offers unprecedented opportunities to prepare nanomaterials with defined structure and function on the nanometre scale. However, the small length scales involved in nanomaterials present challenges in their characterisation, and in turn, their interaction with biological systems. The Advanced NanoBiomaterials Imaging Facility will provide state-of-the-art equipment for examining the properties of nanomaterials and their interaction with biosystems. The equipment will facilitate the development of new materials that are expected to underpin advances in drug delivery, diagnostics and implant devices, further strengthening Australia's strong reputation in these areas.

LE0989226 Prof WR Heath; A/Prof FR Carbone; Prof J McCluskey; Dr A Brooks; Prof DI Godfrey; Prof PC Doherty; Dr SJ Turner; Dr AW Purcell; Prof PA Gleeson; A/Prof IR van Driel; Prof J Rossjohn; Dr EL Hartland; Dr TC Beddoe

Approved Project Title **Multi-photon imaging for infection, immunity, and self recognition**

2009 : \$ 340,000

Primary RFCD 3202 IMMUNOLOGY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

This proposal will address a gap in our imaging capabilities, allowing us to visualise the movement of immune cells and infectious agents such as bacteria and viruses within living tissues. This will immensely improve our capacity to understand interactions between the immune system, invading organisms and the rest of our body. The intravital imaging system will provide novel insights into how the immune system works, which will benefit the design of vaccines, the treatment of cancer, and our understanding of allergy. This state-of-the-art facility will also provide vital training in an emerging technology that will have application in many areas of biology.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989125 A/Prof SD Kolev; Dr IE Woodrow; A/Prof ID McKelvie; Dr BF Abrahams; A/Prof M Ashokkumar; Dr RA Caruso; A/Prof CS Cobbett; Dr PL Cook; Dr PS Donnelly; Dr MR Grace; Prof AA Hoffmann; Prof RA O'Hair; Prof CH Schiesser; Prof AG Wedd; A/Prof JM White; Dr U Wille; Dr SJ Williams; A/Prof CG Young; Dr S Yuen

Approved Project Title **Enhanced Capacity in Ultra-Trace Level Detection and Speciation of Compounds of Environmental, Biological and Materials Science Interest**

2009 : \$ 150,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

Administering Organisation The University of Melbourne

Project Summary

The proposed integrated facility will strongly support collaborative research in areas of high national priority. These are environmental sustainability, development of new materials and designing molecules of therapeutic value on the basis of better understanding the relevant biological processes. This support will lead to maximizing the outcomes of numerous projects already funded by the Australian Research Council which require accurate and highly sensitive analysis. This will improve the cost effectiveness of research funding and will further strengthen the outstanding reputation of Australia science worldwide.

LE0989390 Prof KA Nugent; A/Prof AG Peele; A/Prof PC Dastoor; A/Prof WM Skinner; Dr WP Gates; A/Prof AF Masters; Prof L Tilley; Dr PR Heraud; Prof PA Lay; Dr BC Cowie; Dr DJ Paterson

Approved Project Title **Versatile Scanning X-ray Microscopy Facility at the Australian Synchrotron**

2009 : \$ 500,000

Primary RFCD 2404 OPTICAL PHYSICS

Partner Organisations & Collaborating Organisations

The University of Melbourne

Monash University

La Trobe University

The University of Newcastle

The University of Sydney

University of South Australia

Australian Synchrotron

Administering Organisation The University of Melbourne

Project Summary

The challenges of the modern world means that the Australian community must continue to have access to state of the art research tools. An important component of international synchrotron sources is the very high resolution x-ray microscope. These microscopes are used to image samples of biological, material or environmental significance with extraordinary precision. This project will establish such a microscope at the Australian Synchrotron in Clayton, and nucleates an extensive nationwide collaboration that is devoted to the development of this and related techniques and their application to problems of national scientific, environmental and technological importance.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989384 Prof MG Pandy; Prof IM Mareels; Prof R Kotagiri; A/Prof RK Begg; Dr KM Crossley; Dr KE Webster; A/Prof JA Feller; Dr JW Fernandez
Approved Project Title **High-speed, three-dimensional, x-ray fluoroscopy for accurate measurement of human joint motion**
2009 : \$ 233,000
Primary RFCD 2915 BIOMEDICAL ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Melbourne
Victoria University
La Trobe University
National ICT Australia

Administering Organisation The University of Melbourne

Project Summary

This proposal addresses one of the most difficult and long-standing problems in the field of biomechanics: How can human joint motion be measured accurately and non-invasively during common activities such as walking, stair ambulation and running? Low-dose, high-speed, three-dimensional, x-ray fluoroscopy provides an excellent solution to this problem and, in so doing, can play a pivotal role in healthcare, through clinical gait analysis and gait rehabilitation (diagnosis, prevention and treatment of movement disorders); in sports, through the development of personalized training programs for elite athletes; and in entertainment, through the creation of physics-based animations for the video/digital games industry.

LE0989197 Dr U Wille; Dr ML Coote; Prof CH Schiesser; Prof KP Ghiggino; Prof P Mulvaney; A/Prof SD Kolev; Prof JW White; Dr E Rizzardo
Approved Project Title **Reaction Kinetics Analysis Facility**
2009 : \$ 225,000
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Melbourne
The Australian National University
CSIRO Molecular & Health Technologies

Administering Organisation The University of Melbourne

Project Summary

This proposal will establish a world-class resource to support major research efforts in a wide range of applications associated with the study of reaction mechanisms and intermediates in systems ranging from small molecules to complex polymers. This facility, which is unique in Australia and strongly builds on the broad expertise of the involved researchers at the participating institutions, will address an important need in the areas of physical-organic and physical chemistry by strengthening our capacity for cutting-edge research in reactive intermediate chemistry. The Facility will help to establish frontier technologies in the chemical sciences for building and transforming Australian industries in line with national research priorities.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Queensland

Griffith University

LE0989487 A/Prof EM Gray; Prof JF Dobson; Prof PA Webley; A/Prof K Suzuki; Dr AL Dicks; Prof AK Dahle; Prof J Zhu; Dr BB Dhal; Dr GD Will

Approved Project Title **The National Hydrogen Materials Reference Facility**

2009 : \$ 350,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

Griffith University

Monash University

The University of Queensland

Curtin University of Technology

Queensland University of Technology

Administering Organisation Griffith University

Project Summary

Hydrogen energy technology is a vital element in the global response to climate change owing to increasing atmospheric carbon dioxide levels from burning fossil fuels. Hydrogen is a universal energy carrier that facilitates the transformation of energy from renewable and other sources for applications in industry, transport and homes. The National Hydrogen Materials Reference Facility is a multidisciplinary, state-of-the-art experimental facility for materials science supporting excellent research into advanced materials for hydrogen generation from fossil fuels and by solar means, hydrogen storage for automotive and stationary applications, hydrogen distribution and hydrogen end use, particularly in fuel cells that generate electricity.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

James Cook University

LE0989642 Dr PL Munday; Prof BL Willis; Prof DJ Miller; Dr WP Leggat; A/Prof MI McCormick; Dr AH Baird; Dr TD Ainsworth; Prof D Yellowlees; Dr MJ van Oppen; Dr AP Negri

Approved Project Title **Environmentally Controlled Infrastructure to Investigate the Effects of Climate Change on the Great Barrier Reef**

2009 : \$ 150,000

Primary RFCD 2799 OTHER BIOLOGICAL SCIENCES

Partner Organisations & Collaborating Organisations

James Cook University
Australian Institute of Marine Science (AIMS)
Great Barrier Reef Marine Park Authority
Administering Organisation James Cook University

Project Summary

The coral reefs of Australia, particularly the Great Barrier Reef, Ningaloo Reef, and Lord Howe Island World Heritage Area are Australian national icons, of great economic, social, and aesthetic value to this country. Climate change has the potential to impact the biodiversity of these reefs and their sustainable management. Temperature, CO₂, pH and light can affect coral and fish reproduction, coral bleaching and the response to other anthropogenic intrusions. This facility will provide essential infrastructure for conducting fundamental research on these issues and will directly interface with management agencies to assist with the sustainable management of Australian reefs.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Queensland

LE0989090 Prof RA Fotheringham; Prof DJ Carter; Prof JA Hay; Prof JE Tompkins; Dr L Dale; Mr KG Webster; Ms KM Kilner; Dr J Huggins; Prof PR Eggert; Prof BH Bennett; Dr EN McMahon; Prof RW Dixon; Prof EA Webby; Mr P Minter; Mr RH Coleman; Mr JF Arnold; Prof KM Mallan; Prof AJ Patterson; Ms CD Young; Prof W Ommundsen; Dr E Blackmore; A/Prof CM Taylor; Asst Prof RA Phiddian; A/Prof TA Bunda; Prof CM Bradford; Ms AH Horn; Prof DJ Haskell; Ms DM Bird; Dr TN Burrows

Approved Project Title **AustLit Phase Three: Transforming the Study of Australian Literature through a Collaborative eResearch Environment**

2009 : \$ 650,000

Primary RFCD 4202 LITERATURE STUDIES

Partner Organisations & Collaborating Organisations

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

Administering Organisation The University of Queensland

Project Summary

AustLit's information and research services reach into virtually all avenues of Australian society. From the high level professor of English or Australian Studies to the student accessing the internet at an Indigenous knowledge centre in outback Queensland or the NT, AustLit provides both basic and complex information and research support to every enquirer. The proposed expansion in 2009 will enhance its value to many Australian communities by providing advanced capacities for research and greater levels of high quality information and full text content. Its multi-dimensional approach to the services it delivers ensures that it will continue to build value to the whole community over time.

LE0989436 Prof IH Frazer; Prof CC Nelson; Dr RJ Steptoe; A/Prof GR Monteith; Prof MA Brown; Dr NA McMillan; Prof R Thomas; A/Prof NA Saunders; Prof AC Herington; Dr JD Hooper

Approved Project Title **Multiphoton microscopy of living animals as a tool for immunology and cell biology studies**

2009 : \$ 400,000

Primary RFCD 3202 IMMUNOLOGY

Partner Organisations & Collaborating Organisations

The University of Queensland
Queensland University of Technology
Princess ALexandra Hospital

Administering Organisation The University of Queensland

Project Summary

The multiphoton microscope will enable us to watch the growth, migration and interactions of cells in a living animal in response to changes in the cells' environment will give us better understanding of how we work as living machines, and what can go wrong with that process to make us unwell.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989608 Prof O Hoegh-Guldberg; Dr DI Kline; Dr KR Anthony; Dr SG Dove; Prof MT McCulloch; Dr BN Opdyke; Dr JM Lough; Dr PG Brewer; Mr WJ Kirkwood
Approved Project Title **The Heron Island Climate Change Observatory: An In-Situ Ocean Acidification and Carbonate Chemistry Monitoring Platform**
2009 : \$ 190,000
Primary RFCD 2707 ECOLOGY AND EVOLUTION

Partner Organisations & Collaborating Organisations

The University of Queensland
The Australian National University
Monterey Bay Aquarium Research Institute
Australian Institute of Marine Science (AIMS)

Administering Organisation The University of Queensland

Project Summary

Climate change and ocean acidification are widely recognized as key threats to Australia's natural ecosystems, yet we are currently ill-equipped to respond due to poor knowledge of the scale/nature of the impacts. The Heron Island Climate Change Observatory will establish key infrastructure that will rapidly improve our understanding of the impacts of ocean acidification which is important to local communities and the nation given that coral reefs support over \$6 billion in revenue (and employ 60,000 people) each year. This critically important information is essential to the management and protection of Australia's coral reefs, including the Great Barrier Reef.

LE0989675 Prof AV Nguyen; Prof DD Do; Dr GR Birkett; Prof V Rudolph; Prof GM Lu; Prof SK Bhatia; A/Prof JC Diniz da Costa; Prof GM Evans; Prof GJ Jameson; Dr CM Phan; Prof R De Marco; Prof MO Tade; A/Prof HM Ang; A/Prof P Pendleton; Prof Y He
Approved Project Title **Interface-specific facility for quantifying adsorption and structures at particulate interfaces**
2009 : \$ 180,000
Primary RFCD 2906 CHEMICAL ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Queensland
Curtin University of Technology
James Cook University
The University of Newcastle
University of South Australia

Administering Organisation The University of Queensland

Project Summary

The facility will be used by the collaborating universities to investigate adsorption and interface properties with great precision, and to develop new and improved technologies for coal and mineral processing, saline water utilisation, water desalination, energy production and environment protection. In particular, the project will investigate innovative ways of using ion-interface interactions in saline water for cleaning coal and recovering value minerals by flotation, and for improving dissolved air flotation used in water treatment and desalination to produce drinking water. The project will further investigate novel ways of capturing CO₂, storing natural gases and hydrogen, and tailoring nutrient nano-crystals for foliar delivery.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989334 Prof MA Ragan; Dr SM Grimmond; Dr GE Muscat; Dr RD Teasdale; Mr JR Barker; Dr AJ Gorse; Dr CA Wells; Dr MH Little

Approved Project Title **An integrated high-performance computational platform powering systems biology investigation**

2009 : \$ 400,000

Primary RFCD 2799 OTHER BIOLOGICAL SCIENCES

Partner Organisations & Collaborating Organisations

The University of Queensland

Griffith University

Australian Stem Cell Centre

Administering Organisation The University of Queensland

Project Summary

Systems biology is the study of the organism as a whole and provides a deeper understanding of biological processes than is possible by studying components separately. Recognised as essential for biological research, we propose to establish an advanced computational platform to study these processes at a systems level. Its hardware and specialised software will allow Australian researchers to examine complex pathways involved in animal and human health and disease, as well as in biotechnology and environmental processes. It will provide unique capabilities not currently available in Australia, and help Australian researchers remain internationally competitive in breakthrough science and frontier technologies.

LE0989067 A/Prof J Zhao; A/Prof JD Woodhead; Prof AR Chivas; Prof JR Dodson; Prof M Archer; Dr RN Drysdale; Dr GE Webb; Dr AM Scheffers; Dr GJ Prideaux; Prof J Drennan; Prof JM Pandolfi; Prof O Hoegh-Guldberg; A/Prof PM Vasconcelos; A/Prof SD Golding; Dr M Gasparon; Dr G Rosenbaum; A/Prof D Neil; Dr HA McGowan; Dr PT Moss; A/Prof MI Weisler; Dr K Yu; Dr GJ Price; Dr Y Feng; Dr SG Dove; Dr JC Hellstrom; Dr R Maas; A/Prof JM Hergt; Prof AJ Gleadow; Prof MA Sandiford; A/Prof BP Kohn; Dr ML Cupper; Prof RG Roberts; Prof CD Woodroffe; Prof CV Murray-Wallace; Prof MJ Morwood; Prof GC Nanson; Dr Z Jacobs; Dr PF Carr; Dr HV McGregor; Dr LJ Arnold; Dr D Fink; Dr TM Esat; Dr Q Hua; Dr S Hand; Dr IT Graham; Dr DR Cohen; Dr DK Curnoe; Dr AI Herries; Dr CR Sloss; Prof WE Boyd; Dr SR Scheffers; Dr KH Taffs; Dr JF Parr

Approved Project Title **The future of palaeoclimate and archaeological research in Australia: next generation instrumentation for chronology and environmental reconstruction**

2009 : \$ 950,000

Primary RFCD 2603 GEOCHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Queensland

The University of Melbourne

University of Wollongong

Australian Nuclear Science & Technology Organisation (ANSTO)

The University of Newcastle

Queensland University of Technology

Southern Cross University

The Flinders University of South Australia

The University of New South Wales

Administering Organisation The University of Queensland

Project Summary

The outcomes of this project will promote a better understanding of Australia's arid continent and its surrounding marine environment, contribute to studies of global climate change, and provide new insights into the response of fragile ecosystems to such events and processes. The project addresses directly the National Research Priority 'Water - a critical resource', 'Responding to climate change and variability', 'Overcoming soil loss, salinity and acidity', 'Sustainable use of Australia's biodiversity' and 'Understanding our region and the world'. It provides a consortium-type platform for highly productive collaborative research and training across eight universities and one research organisation in Australia.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

South Australia

The Flinders University of South Australia

LE0989068 Dr GG Andersson; Prof HJ Griesser; Dr GF Metha; Prof GG Warr; A/Prof R Singh; A/Prof WM Skinner; Dr JS Quinton; Dr Z Liu
Approved Project Title **Equipment for Metastable Induced Electron Spectroscopy: surface analysis with excellent surface sensitivity.**
2009 : \$ 637,120
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The Flinders University of South Australia
University of South Australia
The University of Adelaide
The University of Sydney
Monash University

Administering Organisation The Flinders University of South Australia

Project Summary

One of the major research strengths of Australia is surface science as it is important for both fundamental and industry related research. In many cases it is crucial to investigate the outermost layer of a material or mineral. Metastable Induced Electron Spectroscopy is an ideal technique as it is sensitive exclusively to the outermost layer of a broad range of samples. The information gained is not accessible by any other method. The proposed equipment will be the first of this type in Australia and will complement existing surface science facilities. The project will enhance Australia's position in surface science internationally and a large number of projects will benefit from access to the equipment.

LE0989062 A/Prof JM Hacker; A/Prof J Beringer; A/Prof JP Walker; A/Prof MM Lewis; A/Prof MJ Lynch; Dr LB Hutley; Dr PJ Baker; Dr E Daly; Prof ID Bishop; Dr MJ Stewardson; Dr PR Fearn; Dr S Maier
Approved Project Title **Airborne hyper-spectral scanning for advanced monitoring and assessment of vegetation and water properties**
2009 : \$ 450,000
Primary RFCD 3008 ENVIRONMENTAL SCIENCES

Partner Organisations & Collaborating Organisations

The Flinders University of South Australia
Monash University
The University of Melbourne
Curtin University of Technology
The University of Adelaide
Charles Darwin University

Administering Organisation The Flinders University of South Australia

Project Summary

The proposed infrastructure will give Australian researchers the most advanced capabilities available world-wide in airborne remote sensing of the environment. By combining hyper-spectral scanning, with full wave-form resolving Light Detection and Ranging (LIDAR), microwave scanning and synthetic aperture RADAR, flown simultaneously on the most cost-efficient and technologically advanced research aircraft, it will be possible to assess and monitor a wide range of parameters not accessible to airborne methods before.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Adelaide

LE0989374 Prof JH Bowie; Prof A Ball; Prof DA Brooks; Prof MA Buntine; Dr T Chataway; Dr P Hoffmann; Prof WD Lawrance; Prof AF Lopez; Prof SR McColl; Prof JO Miners; A/Prof NH Voelcker
Approved Project Title **South Australian High-Resolution and Ion-Mobility Mass Spectrometry Facility**
2009 : \$ 550,000
Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Adelaide
The Flinders University of South Australia
University of South Australia
Hanson Institute (IMVS)
CSIRO Health Flagship

Administering Organisation The University of Adelaide

Project Summary

The analytical facility will enhance (i) fundamental research to understand the mechanisms of the reactions of charged species with neutral molecules, and (ii) the provision of structural information, including the precise atomic composition of any molecule, small or large. Research supported by this facility includes (a) nanotechnology, including supramolecular chemistry, (b) bioscience: cancer research, neurodegenerate diseases (e.g. Parkinson's disease) osteoarthritis, inflammation, cardiac diseases and synthetic approaches to anticancer and other drugs.

LE0989747 Dr TW Kee; Prof TM Monro; Prof D Abbott; Dr BM Fischer; Prof MA Buntine; Dr GF Metha; Prof JA Carver; Dr DA Beattie; Prof CA Prestidge; Prof RA Lewis; Dr DG Lancaster; Dr U Bach
Approved Project Title **Ultrafast Dynamics Measurement Facility for the Physical, Biochemical, and Materials Sciences**
2009 : \$ 400,000
Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Adelaide
University of South Australia
Defence Science & Technology Organisation (DSTO)
University of Wollongong
Monash University

Administering Organisation The University of Adelaide

Project Summary

The term "ultrafast revolution" describes the transformations in science due to ultrafast laser technology. Today, ultrafast lasers are used in surgery, nanomaterial fabrication, biomedical imaging, spectroscopic investigations, and new applications are still emerging. This facility will draw together leading chemists, physicists, and engineers to investigate key ultrafast processes and phenomena in the physical, biochemical and material sciences. This is of strategic importance to keep Australia at the global forefront for scientific endeavours, supporting new research and commercial opportunities. This facility will also produce highly trained graduates, who will find employment in industry throughout Australia and globally.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989336 Dr CJ Sumby; Prof JA Carver; Prof JC Wallace; Asst Prof M Hrmova; Prof A Pring; Prof AD Abell; Dr GW Booker; Prof MI Bruce; Dr J Brugger; Dr CM Ford; Dr HH Harris; Dr JC Morris; Prof JC Paton; Dr DJ Peet; Dr SM Pyke; Dr KE Shearwin; Dr RI Menz; Dr CA Abbott; Dr PA Anderson; Dr MH Brown; Dr MR Johnston; Dr KA Schuller; Prof AF Lopez; Dr SM Pitson; Prof SF Lincoln; Prof RA McKinnon

Approved **The South Australian Facility for Small and Large Molecule X-Ray Diffraction Structure**

Project Title **Determination**

2009 : \$ 560,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisations & Collaborating Organisations

The University of Adelaide

The Flinders University of South Australia

South Australian Museum

Institute of Medical and Veterinary Science

University of South Australia

Administering Organisation The University of Adelaide

Project Summary

The precise three dimensional arrangement of atoms within molecular and macromolecular structures defines their function. Thus, the discovery, development and application of biological compounds, catalysts, nanodevices and pharmaceuticals require X-ray diffraction structure determination. These endeavours underpin the conversion of academic research into real benefits for the community and are critical for the competitiveness of Australian industry, national productivity and economic growth. This application seeks to provide a facility for multidisciplinary scientific development that will enhance academic-industrial collaboration. This will position SA research community for scientific breakthroughs that benefit the Australian community.

Western Australia

Curtin University of Technology

LE0989180 Prof CE Buckley; Prof JD Gale; A/Prof MI Ogden; Dr AM Mulders; Dr BB Dhal; A/Prof H Wu; Prof B O'Connor; Dr SI Bailey; A/Prof BJ Kinsella; Dr M Makha; Dr Z Liu; Dr KL Swaminatha-Iyer; A/Prof HT Chua; Dr X Wang; Dr EF May; Dr L Gao; Dr M Kandil; Dr G Watson; Dr A Yu

Approved Project Title Facility for studying the sorption properties of gases by nanostructured materials

2009 : \$ 150,000

Primary RFCD 2914 MATERIALS ENGINEERING

Partner Organisations & Collaborating Organisations

Curtin University of Technology

The University of Western Australia

Murdoch University

Administering Organisation Curtin University of Technology

Project Summary

The climate debate has put the issues that this research will address at the forefront of community concern. All of the initiatives discussed herein are relevant to alternative energy sources and greenhouse gas reduction. The facility will ensure that the research undertaken will be internationally cutting edge and will hasten the adoption of technologies that will flow from the research, thereby reducing the effects of the impending energy crisis and related global pollution issues. The current capability for accurately measuring gas sorption in materials for storage and sequestration is limited in W.A. and the proposed facility will address this situation.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

The University of Western Australia

LE0989351 A/Prof EL Ghisalberti; Prof SJ Berners-Price; A/Prof MI Ogden; Prof MG Humphrey; A/Prof MV Baker; Prof CS Bond; Dr GR Flematti; Dr GA Koutsantonis; Dr AJ McKinley; Dr MJ Piggott; Dr SM Saunders; Prof MA Spackman; Dr SG Stewart; Dr DH Brown; Dr RL Mancera; A/Prof M Mocerino; Prof CJ Easton; A/Prof MS Sherburn

Approved Project Title **High Resolution Mass Spectrometry Facility**

2009 : \$ 425,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

The University of Western Australia
Curtin University of Technology
The Australian National University

Administering Organisation The University of Western Australia

Project Summary

The research that will be supported by this vital infrastructure impacts on the sustainable environment through understanding the process of seed germination and the human condition through new drugs for the treatment of cancer and Parkinson's disease. Fundamental science will also be addressed particularly in the fields of photonics and the nature of interactions between matter.

LE0989071 Prof JT Lambers; Prof ID Small; Prof JM Whelan; Prof AH Millar; Prof SM Smith; A/Prof M Barbetti; Prof Z Rengel; Prof RP Oliver; Dr TD Colmer; Prof K Siddique; A/Prof GE Hardy; Dr EJ Veneklaas; Prof Dr K Sivasithamparam; Dr PM Finnegan; Dr SR Ellwood; A/Prof JA Plummer; Dr M Ryan; Dr G Yan; A/Prof M Tibbett; Dr PS Solomon

Approved Project Title **Phytosphere: new facilities for controlled manipulation of effects of climate change & airborne pollutants on disease epidemiology & plant performance**

2009 : \$ 600,000

Primary RFCD 2704 BOTANY

Partner Organisations & Collaborating Organisations

The University of Western Australia
Murdoch University

Administering Organisation The University of Western Australia

Project Summary

Western Australia is home to a range of world-leading plant science research groups. Establishing a world-class multi-purpose phytosphere facility in WA will enable these groups to remain at the forefront of their research fields and continue to attract high-profile international scientists and students. Such a facility will result in significant advancement of our understanding of the impact of climate change on plants through biotic stresses (e.g., disease epidemiology, plant-pathogen interactions) and in interaction with abiotic variables (e.g., CO₂ concentrations, temperature, light intensity, humidity, moisture stress, airborne pollutants such as SO₂), and allow crop yield optimisation in future environments.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989649 Prof DD Sampson; Prof ME Barley; Dr SJ Barnes; Dr T Baroni; Prof PA Cawood; Dr JS Cleverley; A/Prof HT Chua; Prof RJ Gilkes; Prof BJ Griffin; A/Prof SG Hagemann; Dr S Hinckley; Dr RM Hough; Dr MR Kilburn; Prof Y Liu; A/Prof DJ Macey; Prof TC McCuaig; Prof NJ McNaughton; Dr JR Muhling; Prof B Rasmussen; Prof CL Raston; Dr A Suvorova; Prof A van Riessen; Prof SA Wilde

Approved **The Nanoscale Characterisation Centre WA Electron Microprobe Facility**

Project Title

2009 : \$ 800,000

Primary RFCD 2601 GEOLOGY

Partner Organisations & Collaborating Organisations

The University of Western Australia

Curtin University of Technology

Murdoch University

Edith Cowan University

CSIRO - Exploration & Mining

Alcoa World Alumina

Administering Organisation The University of Western Australia

Project Summary

A new-generation electron microprobe will support many fields of scientific endeavour that underpin Australia's future prosperity. The ability to map element distributions in minerals and derive quantitative analyses is essential for research into the formation of ore deposits, how to find them and how to develop them in a sustainable manner. Nanotechnology and materials science hold the keys to future developments in communications, computing, catalysis, medicine, environmental remediation and more. By increasing the performance of the unique WA ion probe suite, the electron microprobe will contribute to new basic science and to Australia's scientific reputation for this flagship instrumentation.

LE0989782 Prof DD Sampson; Dr JS Croser; A/Prof M Degli-Esposti; Prof SA Dunlop; Prof DJ Hampson; Prof AR Harvey; Dr KA Heel; Dr CM James; Dr C Kahler; Prof SP Klinken; Prof PJ Leedman; Prof BJ Marshall; Prof AH Millar; Dr AR Murch; Dr JK Phillips; Dr PJ Rigby; A/Prof UM Ryan; Prof GA Stewart; Dr PA Stumbles; Prof RC Thompson; A/Prof AM Waite; Prof JM Whelan; Prof GE Wilcox; Prof GC Yeoh; Dr M Ziman

Approved **A Core Western Australian Cell Sorting Facility - Ultra-Small Objects and Rare Cell**

Project Title **Populations**

2009 : \$ 524,000

Primary RFCD 2706 PHYSIOLOGY

Partner Organisations & Collaborating Organisations

The University of Western Australia

Murdoch University

Edith Cowan University

PathWest Laboratory Medicine WA

Administering Organisation The University of Western Australia

Project Summary

This new generic capacity to rapidly isolate structures smaller than the cell has extraordinarily wide application in the biological sciences. Making this capacity widely accessible through a core facility to the Western Australian research community will generate research outcomes of national and community benefit. Sorting chromosomes to better understand genetic abnormalities and sorting bacteria to better understand and reduce bacterial infection will result in improvements in human health. Sorting parasites, bacteria and immune cells will lead to new animal vaccines for parasites and diseases such as bird flu. Sorting marine plankton will lead to more sustainable marine ecosystems and fisheries.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989788 A/Prof TG St Pierre; Prof RN Martins; Prof SM Smith; Prof SJ Berners-Price; Prof SA Dunlop; Prof AR Harvey; Prof CL Raston; Prof D Robertson; Prof GC Yeoh; Dr BA Corry; Dr L Fitzgerald; Dr MJ House; Dr GA Koutsantonis; A/Prof L Lim; Dr M Makha; Dr D Meyrick; Dr G Plant; Dr J Rodger; Dr M Ruitenber; Dr KL Swaminatha-Iyer; Dr G Verdile; Dr VP Wallace; Dr RC Woodward

Approved Project Title **Nuclear Magnetic Resonance Microimaging and Relaxometry Facility**

2009 : \$ 108,481

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Partner Organisations & Collaborating Organisations

The University of Western Australia

Edith Cowan University

Administering Organisation The University of Western Australia

Project Summary

Many of the research projects to be supported by the facility are dedicated to improving our understanding of conditions and diseases that detrimentally affect many in our community. Projects investigating Alzheimer's disease, the central nervous system and its ability to repair, cancer and associated therapeutic treatments are some of the areas that will benefit from access to this equipment. The new facility will also provide unique insights into aspects of fundamental plant biology, with implications for improving crop productivity and better managing our natural ecosystems. The community will also benefit from the development and testing within the facility of new diagnostic tools and markers for a range of diseases.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

Tasmania

University of Tasmania

LE0989539 Prof AJ Canty; Prof GM Peterson; Prof Dr PN Nesterenko; A/Prof TW Trull; Prof CG Carter; Dr CM Crawford; Dr AR Bowie; Dr AT Townsend; Dr AJ Seen; Dr I Snape; Dr EC Butler
Approved **Purchase of a state-of-the-art high resolution inductively coupled plasma mass spectrometer**
Project Title
2009 : \$ 250,000
Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

University of Tasmania
Australian Antarctic Division
Antarctic Climate and Ecosystems CRC
CSIRO Marine and Atmospheric Research

Administering Organisation University of Tasmania

Project Summary

This new state-of-the-art mass spectrometer with enhanced capability will allow Tasmanian researchers to accurately determine the elemental composition of their samples of interest. The instrument will be extremely sensitive and will be able to detect elements to very low concentrations. It will be used to support a diverse range of local research projects of international significance, for example the environmental assessment of clean and contaminated sites, chemical synthesis on a miniature scale using micro-chips, and the monitoring of selected elements of key importance for human health.

LE0989828 A/Prof LV Danyushevsky; Prof RR Large; Prof AJ Crawford; Prof V Kamenetsky; A/Prof DR Cooke; Prof JB Gemmell; Dr TJ Falloon; Dr RF Berry; Dr GJ Davidson
Approved **An X-ray fluorescence analysis system to replace an existing 16 year old instrument**
Project Title
2009 : \$ 245,000
Primary RFCD 2601 GEOLOGY

Partner Organisations & Collaborating Organisations

University of Tasmania

Administering Organisation University of Tasmania

Project Summary

X-ray fluorescence spectrometry is a basic analytical tool for the accurate and precise determination of the chemical composition of rock samples. Access to this technology is essential for the successful operation of the ARC Centre of Excellence in Ore Deposits. The Centre undertakes cutting-edge research on the geology, genesis, discovery and recovery of new mineral resources and equipping the Australian minerals industry with world-class graduates. These activities are within National Research Priorities ((An Environmentally Sustainable Australia - Discovering Deep Earth Resources) and at the core of Australian national interests.

LE0989491 Prof PR Haddad; Prof PJ Marriott; Dr RA Shalliker; Prof Dr PN Nesterenko; Dr GW Dicoski; Dr EF Hilder; Dr MC Breadmore; Dr J Quirino; Dr RM Guijt; Dr RA Shellie
Approved **Multi-Purpose Mass Spectrometry Facility**
Project Title
2009 : \$ 172,025
Primary RFCD 2504 ANALYTICAL CHEMISTRY

Partner Organisations & Collaborating Organisations

University of Tasmania
RMIT University
University of Western Sydney

Administering Organisation University of Tasmania

Project Summary

The Australian Centre for Research on Separation Science (ACROSS) has been established using focused research themes to provide both fundamental and applied research outcomes in separation science. The requested Time of Flight Mass Spectrometer (TOFMS) will be utilised extensively by a large team of researchers working across the broad areas of analytical chemistry, pharmaceutical science, materials science, biochemistry, microfluidics, industrial chemistry and hydrometallurgy, aquaculture, forensic analysis, Antarctic studies, and environmental monitoring. This will directly support our work falling under National Research Priorities 1 An Environmentally Sustainable Australia, 2 Promoting and Maintaining Good Health, 3 Frontier Technologies for Building and Transforming Australian Industries, and 4 Safeguarding Australia.

Australian Capital Territory

The Australian National University

LE0989474 Prof MG Banwell; Prof CJ Easton; Prof LN Mander; A/Prof MS Sherburn; Dr MD McLeod

Approved Project Title **Organic Synthesis and Reaction Processing Facility**

2009 : \$ 200,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Partner Organisations & Collaborating Organisations

The Australian National University

Administering Organisation The Australian National University

Project Summary

Chemical synthesis is not only an important activity in its own right but one that provides compounds required in biology and physics. This enterprise is thus pivotal to many activities associated with a modern economy. Accordingly, it is vital to maintain a cutting-edge capacity in synthetic organic chemistry. The requested equipment will be assembled to create a state-of-the-art facility serving the needs of some sixty researchers engaged in diverse aspects of organic synthesis including those associated with the development of new antibiotics, drug delivery systems and molecular machines.

LE0989731 Dr SM Eggins; Dr MJ Ellwood; Prof WA Maher; Prof MT McCulloch; Prof AR Chivas; Dr SD Foster; Dr DF Jolley; Dr MH Wille; Prof P De Deckker; Dr SJ Fallon

Approved Project Title **Instrumentation for Innovative Marine Biogeochemistry**

2009 : \$ 700,000

Primary RFCD 2604 OCEANOGRAPHY

Partner Organisations & Collaborating Organisations

The Australian National University

University of Canberra

University of Wollongong

Administering Organisation The Australian National University

Project Summary

Rising greenhouse gases are changing the chemistry of the oceans, by altering the availability of nutrients and causing ocean acidification. Along with local pollutants, these changes pose significant threats to the productivity and sustainability of Australia's marine ecosystems. The proposed instrumentation will support world-leading research into the nature, impact, and potential for mitigating these changes. This will underpin our ability to manage and preserve the environmental, societal and economic values of our coastal and open ocean marine resources.

LE0989072 Prof WJ Foley; Prof DB Lindenmayer; Dr IR Wallis; A/Prof K French; Prof WA Buttemer

Approved Project Title **High throughput nitrogen analysis for ecological studies**

2009 : \$ 100,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Partner Organisations & Collaborating Organisations

The Australian National University

University of Wollongong

Administering Organisation The Australian National University

Project Summary

Australian environments are unproductive partly because they contain little Nitrogen (N) and changes in atmospheric CO₂ will exacerbate this. Furthermore, animals cannot extract all the N from the plants they eat. An assay has been developed that measures how much they can extract (available N) and it is intended to use it to measure habitat quality and the effects of climate change over large tracts of land. This requires thousands of N analyses. The equipment we are requesting - a LECO combustion analyser, allows us to analyse samples quickly and safely and uses fewer chemicals and much less water than do traditional machines.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989624 Dr MK Gagan; Prof P De Deckker; Dr SM Eggins; Dr BN Opdyke; Dr MJ Ellwood; Dr SJ Fallon; Dr LK Ayliffe; Prof Dr R Grün; Prof GD Farquhar; Dr JJ Brocks; Dr SL O'Connor; Dr SG Haberle; Prof SF Cox; Dr MD Norman; Prof TR Ireland; Dr IS Williams; Dr A Dutton; Dr PC Treble; Prof JR Dodson; Dr D Fink; Dr Q Hua; A/Prof ID Goodwin; Dr P Hesse; Dr S Frisia; Dr GJ Prideaux

Approved Project Title **A high performance stable-isotope microanalytical facility for environmental Earth science and climate change research**

2009 : \$ 200,000

Primary RFCD 2606 ATMOSPHERIC SCIENCES

Partner Organisations & Collaborating Organisations

The Australian National University
Australian Nuclear Science & Technology Organisation (ANSTO)
Macquarie University
The University of Newcastle
The Flinders University of South Australia

Administering Organisation The Australian National University

Project Summary

Australia is exceptionally well positioned to play a lead role in the international effort to predict climate change, human impacts on the environment, and great submarine earthquakes and tsunamis. The new-generation stable-isotope microanalytical facility will give Australia unprecedented technical and modelling capacities and maximise the impact of high-profile research in the earth sciences. Every Australasian nation will benefit from new knowledge that is essential to address civilisation's most serious environmental threats. The new facilities will foster outstanding opportunities for collaboration, post-graduate education, and research training with outcomes that will engage the public in the excitement of scientific discovery.

LE0989408 Dr W Hillier; A/Prof RJ Pace; Prof TJ Wydrzynski; Dr OK Atkin; Prof MR Badger; A/Prof GD Price; Dr JR Evans; Dr SM Whitney; Prof S Von Caemmerer; Prof GD Farquhar

Approved Project Title **A multiple-ion membrane inlet mass spectrometer**

2009 : \$ 150,000

Primary RFCD 2704 BOTANY

Partner Organisations & Collaborating Organisations

The Australian National University

Administering Organisation The Australian National University

Project Summary

There is a compelling need for a modern isotope-ratio mass spectrometer to facilitate a range of innovative studies of chemical and biochemical processes. Mass spectrometers operated with a thin permeable membrane over a vacuum inlet allow small gas molecules to be continuously monitored inside specific gas or liquid phase sample chambers. The proposed instrumentation will enable simultaneous and highly sensitive measurement of 10 different isotopic species and the capability for detection of hydrogen. This equipment will provide the many researchers and students with opportunities to determine isotopic signatures of isolated chemical reactions through to complex biochemical systems of whole living cells.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989093 Prof DE McClelland; Prof J Munch; Dr BJ Slagmolen; A/Prof PJ Veitch; Dr DA Shaddock; Dr DH Shoemaker; Dr SE Whitcomb; Dr A Lazzarini; Dr JN Marx

Approved Project Title **Australian Partnership in Advanced LIGO**

2009 : \$ 400,000

2010 : \$ 500,000

2011 : \$ 500,000

2012 : \$ 400,000

Primary RFCD 2401 ASTRONOMICAL SCIENCES

Partner Organisations & Collaborating Organisations

The Australian National University

The University of Adelaide

California Institute of Technology

Administering Organisation The Australian National University

Project Summary

Advanced Interferometer Gravitational-Wave Observatory (LIGO) (AdvLIGO) will be the first gravitational wave observatory capable of frequent observation of known sources of gravitational waves leading to the birth of gravitational wave astronomy. The development of instruments capable of doing this is driving technology in fields such as lasers, optics, photonics and data analysis. By playing a key role in this facility, Australia will reap the scientific and technical rewards of being part of the most exciting frontier of physics in the 21st Century whilst training scientists and technologists for tomorrow.

LE0989083 Dr DA Mitchell; Dr BJ Evans; Prof MC Western; A/Prof DN Denemark; Mr GJ McCarthy; Prof NM Nakata; Prof L Mazerolle; Dr JA Byrne; Prof JR Wiseman; Dr MP Crozier; A/Prof AT Kenyon; A/Prof JE McLeod; Prof CB Ferguson; Prof PR Boreham; Dr LA Cheshire; Dr TN Burrows; Dr RJ Denning; Prof Dr LY Behrendt; Prof A Jakubowicz; Prof PF McDonald; Prof I McAllister; Dr EE Gray; Dr LR Smith; Mr SC Hungerford; Ms SK Holloway

Approved Project Title **Australian Social Science Data Archive: Provision of Advanced Research Infrastructure and Collaborative Environment**

2009 : \$ 550,000

Primary RFCD 3602 POLICY AND ADMINISTRATION

Partner Organisations & Collaborating Organisations

The Australian National University

The University of Queensland

The University of Western Australia

The University of Melbourne

Griffith University

University of Technology, Sydney

Other Peak Body: Aust Consortium for Social and Political Research Inc

Administering Organisation The Australian National University

Project Summary

The Australian Social Science Data Archive (ASSDA) supports researchers in a wide range of social science and humanities disciplines. These researchers are both primary and secondary users of data collected across a range of economic, social, political and cultural areas. Increasingly, complex public policy problems require multi-disciplinary solutions based on a range of data sources to address these problems. This proposal provides a means for Australia's leading edge researchers to advance the knowledge base that can lead to the development of strong evidence based policy. The open access policies of ASSDA ensures that the general public, media, non-government organisation (NGOs) and government agencies are able to examine the public use data sets that are used by researchers to arrive at their conclusions.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

LE0989759 Dr MC Ridgway; Prof PA Lay; Prof R De Marco; Dr CT Dillon; Dr HH Harris; Dr RN Collins; A/Prof I Low; Prof SK Bhargava; A/Prof IR Gentle; Prof AR Gerson; Prof TD Waite; Prof DC Creagh; Dr RF Garrett

Approved Project Title **Australian Access to and Operation of Advanced Synchrotron Radiation Facilities at the Photon Factory**

2009 : \$ 180,000
2010 : \$ 180,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisations & Collaborating Organisations

The Australian National University
The University of Sydney
Curtin University of Technology
University of Wollongong
The University of Adelaide
The University of New South Wales
RMIT University
The University of Queensland
University of South Australia
University of Canberra
Australian Synchrotron Research Program/Australian Synchrotron
Australian Nuclear Science & Technology Organisation (ANSTO)
Institute of Materials Structure Science/The Photon Factory, Japan

Administering Organisation The Australian National University

Project Summary

The primary national benefit of this application will be continued access by peer review for Australian scientists to the advanced synchrotron-radiation capabilities of the Australian National Beamline Facility and other complementary beamlines at the Photon Factory, Japan. This proposal is consistent with the National Research Priorities of An Environmentally Sustainable Australia, Promoting and Maintaining Good Health and Frontier Technologies for Building and Transforming Australian Industries and will generate science to support and stimulate domestic industry, enhance the domestic knowledge base and international research profile, train students and future synchrotron scientists and foster domestic and international collaborations.

LE0989589 Dr MF Shannon; Dr ES Dennis; Dr DB McNevin; Dr JG Oakeshott; Dr GE Allison; Dr CI Cazzonelli; Dr MC Cook; Prof MD Crisp; Prof S Eastal; Prof WJ Foley; Prof A Georges; Prof CC Goodnow; Dr DM Gordon; Prof JA Graves; Prof AR Hardham; A/Prof JS Keogh; Dr C Linde; Prof S Mahalingam; Prof R Peakall; Dr BJ Pogson; Prof RB Saint; Prof MJ Spriggs; Dr DJ Tremethick; Dr AG Young

Approved Project Title **A massively parallel genome analysis facility for the ACT region**

2009 : \$ 550,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Partner Organisations & Collaborating Organisations

The Australian National University
CSIRO - Plant Industry
University of Canberra
CSIRO - Entomology

Administering Organisation The Australian National University

Project Summary

Maintaining a healthy environment, supporting a sustainable agriculture industry and providing excellent healthcare are three key requirements for the future of Australia and Australians. Modern biological research has a major role to play in all three areas. The success and application of this research requires a serious investment in the new technologies that enable a systems-wide high throughput approach to biological questions. Co-investing in a massively parallel genome analysis facility to underpin cutting edge environmental, agricultural and biomedical research in the ACT region, will facilitate progress in areas of the utmost importance to the community and future of the nation.

Summary of Linkage Infrastructure, Equipment and Facilities Proposals

University of Canberra

LE0989564 Prof S Mahalingam; A/Prof MS Rolph; Prof CJ Lennard; Dr L Simson; Dr BA Lidbury; Dr MH Frese; Dr BD Cooke; Prof IA Clark; Prof CR Parish; Prof KI Matthaei; Dr DC Tschärke; Dr M Regner; A/Prof PA Keller; Dr MP in het Panhuis; A/Prof SR Raidal; A/Prof PN Smith; Dr PE Roffey; Dr GD Ewart; Dr EM Bertram

Approved Project Title **State-of-the-art facility for human and animal virus research in the Canberra and surrounding regions**

2009 : \$ 150,000

Primary RFCD 2703 MICROBIOLOGY

Partner Organisations & Collaborating Organisations

University of Canberra
The Australian National University
University of Wollongong
Charles Sturt University
The Canberra Hospital
Australian Federal Police - Forensics and Technical
Biotron Ltd

Administering Organisation University of Canberra

Project Summary

New viral diseases continue to emerge and old viruses re-emerge to pose a threat to human and animal health. To combat these, we propose a dedicated viral disease research facility. The centre will include experienced researchers, biotechnology companies and government agencies working on discovery, prevention and treatment of viral diseases. Forging strong scientific links between these organisations will considerably enhance the productivity of these researchers, increase their collaborative and scientific outputs and allow for training of students in the latest technologies. The facility will provide researchers with cutting-edge instrumentation for nationally and internationally important projects that would benefit human health.