

Successful Applications by RFCD
Linkage Infrastructure Equipment and Facilities to Commence in 2006

230000	MATHEMATICAL SCIENCES	1
240000	PHYSICAL SCIENCES	11
250000	CHEMICAL SCIENCES	19
260000	EARTH SCIENCES	5
270000	BIOLOGICAL SCIENCES	14
280000	INFORMATION, COMPUTING AND COMMUNICATION SCIENCES	3
290000	ENGINEERING AND TECHNOLOGY	16
300000	AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES	4
320000	MEDICAL AND HEALTH SCIENCES	4
360000	POLICY AND POLITICAL SCIENCE	1
380000	BEHAVIOURAL AND COGNITIVE SCIENCES	1
410000	THE ARTS	2
420000	LANGUAGE AND CULTURE	1
430000	HISTORY AND ARCHAEOLOGY	1
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TOTAL NUMBER OF GRANTS		83
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Funding identified by primary field of research

RFCD	Classification	Applications Received	Applications Funded	Success Rate (%)	Funding (\$)	Percent Share of total projects funded	Percent share of total funding
30	AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES	11	4	36.4%	\$592,667	4.8%	1.6%
38	BEHAVIOURAL AND COGNITIVE SCIENCES	3	1	33.3%	\$650,000	1.2%	1.7%
27	BIOLOGICAL SCIENCES	28	14	50.0%	\$7,042,610	16.9%	18.9%
25	CHEMICAL SCIENCES	29	19	65.5%	\$7,950,706	22.9%	21.3%
26	EARTH SCIENCES	9	5	55.6%	\$1,422,700	6.0%	3.8%
33	EDUCATION	3	0	0.0%	\$0	0.0%	0.0%
29	ENGINEERING AND TECHNOLOGY	36	16	44.4%	\$8,197,000	19.3%	22.0%
43	HISTORY AND ARCHAEOLOGY	4	1	25.0%	\$350,000	1.2%	0.9%
28	INFORMATION, COMPUTING AND COMMUNICATION SCIENCES	9	3	33.3%	\$1,395,000	3.6%	3.7%
40	JOURNALISM, LIBRARIANSHIP AND CURATORIAL STUDIES	1	0	0.0%	\$0	0.0%	0.0%
42	LANGUAGE AND CULTURE	1	1	100.0%	\$544,000	1.2%	1.5%
23	MATHEMATICAL SCIENCES	1	1	100.0%	\$280,000	1.2%	0.8%
32	MEDICAL AND HEALTH SCIENCES	10	4	40.0%	\$1,664,000	4.8%	4.5%
24	PHYSICAL SCIENCES	19	11	57.9%	\$6,742,050.00	13.3%	18.1%
36	POLICY AND POLITICAL SCIENCE	1	1	100.0%	\$158,844.00	1.2%	0.4%
41	THE ARTS	3	2	66.7%	\$325,000.00	2.4%	0.9%
	Total	168	83	49.4%	\$37,314,577	100%	100%

Summary of Successful Applications by RFCD Division Linkage Infrastructure Equipment and Facilities to commence in 2006

2399 : OTHER MATHEMATICAL SCIENCES

The University of Sydney

LE0668549 Prof PR Reeves; Prof MJ Hynes; Dr EJ Newbigin; Dr RJ Daly; A/Prof EA Musgrove; Prof RJ Trent; Prof FW Nicholas; Dr A Andrianopoulos

Title: Major upgrade of the computing hardware and software for the widely used BioManager

2006 : \$280,000

Category: 2399 - OTHER MATHEMATICAL SCIENCES

Partner Organisation(s)

The University of Sydney
Garvan Institute of Medical Research
The University of Melbourne

Administering Institution: The University of Sydney

Summary:

Computers, associated hardware, and programming support for software are requested for a major upgrade of the BioManager/ANGIS service. The upgrade will provide the increased computer power required to conduct timely comparative analyses, as the sequence and other databases have greatly increased in size and complexity since the last upgrade. In addition, the programmers requested will facilitate the incorporation of the publicly available genome sequences and programs for genome scale analyses, and provide support for analyses of micrarray data.

2401 : ASTRONOMICAL SCIENCES

The Australian National University

LE0668442 Prof BP Schmidt; A/Prof AJ Green; Dr A Melatos; Dr RN Manchester; Dr MJ Drinkwater

Title: The Australian Virtual Observatory

2006 : \$330,000

Category: 2401 - ASTRONOMICAL SCIENCES

Partner Organisation(s)

The Australian National University
The University of Sydney
The University of Melbourne
The University of Queensland
OTHER Australia Telescope National Facility

Administering Institution: The Australian National University

Summary:

The Australian Virtual Observatory is an integral component of the International Virtual Observatory, which will link the archives of all the world's major astronomical observatories into one distributed database, with powerful software tools to maximise the scientific return from this data. In this proposal we seek to create archives of some of Australia's most useful astronomical resources. This information will be in a common, internationally agreed, standard so that they can be accessed by the Astronomical community, through a single interface.

The University of Sydney

LE0668351 Dr JG Robertson; Prof PD Sackett; Prof WJ Couch; Prof RL Webster; Dr BJ Boyle; Dr M Colless; Prof DA Forbes; Dr MJ Drinkwater; Dr JC Lattanzio; Dr QA Parker; Dr BD Carter

Title: Australian Membership of the International Gemini Partnership

2006 : \$1,462,325

2007 : \$1,521,200

Category: 2401 - ASTRONOMICAL SCIENCES

Partner Organisation(s)

The University of Sydney
The Australian National University
The University of New South Wales
The University of Melbourne
CSIRO - Australia Telescope National Facility
Swinburne University of Technology
Anglo-Australian Observatory
The University of Queensland
Macquarie University
University of Southern Queensland
Monash University

Administering Institution: The University of Sydney

Summary:

The International Gemini Partnership is an intergovernmental consortium that operates two 8-metre optical/infrared telescopes, in Chile and Hawaii. Australia joined the IGP in 1998, with 4.76% of the partnership. The Gemini telescopes have been carefully engineered to exploit the superb atmospheric conditions at both sites, allowing users to address key astronomical problems in new ways. Through membership of Gemini, Australian astronomers have access to the world-class facilities necessary to maintain their high international profile, and to enhance the national capacity to construct advanced scientific instrumentation. Australian institutions are currently building two new instruments and conducting a study for a third.

2402 : THEORETICAL AND CONDENSED MATTER**Australian Institute of Nuclear Science and Engineering (AINSE)**

LE0668044 Dr D Mather; Prof JW White; A/Prof EM Gray; Dr BJ Kennedy; A/Prof CE Buckley; Prof SJ Campbell; A/Prof LR Gahan; Dr R Robinson; Dr TJ Hicks; A/Prof EH Kisi

Title: Access for Australian Researchers to Advanced Neutron Beam Techniques

2006 : \$240,000

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisation(s)

Australian Institute of Nuclear Science and
The Australian National University
Griffith University
The University of Sydney
Curtin University of Technology
The University of New South Wales
The University of Queensland
ANSTO
Monash University
The University of Newcastle

Administering Institution: Australian Institute of Nuclear Science and Engineering (AINSE)

Summary:

Neutron scattering is one of the most powerful and important investigative tools in the study of materials. Australia has only a low-flux neutron source, HIFAR, which provides no cold or hot neutrons. This excludes large, important areas of science, such as functional films, polymers, self-assembly systems, biological materials, colloids and emulsions, and real-time in-situ studies. This application aims to continue Australia's partnership with the world's most intense neutron source, ISIS in the UK, in order to sustain the considerable Australian scientific momentum which now relies on ISIS. The outcomes will be new science that cannot be generated solely within Australia.

La Trobe University

LE0668065 Prof JD Riley; Prof RC Leckey; A/Prof PJ Pigram; Dr N Janke-Gilman; A/Prof BF Usher; Prof JF Williams; A/Prof RL Stamps; Dr AP Stampfl; Dr D Yu; Prof TL Tansley; Dr KS Butcher

Title: High resolution images of surfaces

2006 : \$623,000

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisation(s)

La Trobe University
ANSTO
The University of Western Australia
Macquarie University

Administering Institution: La Trobe University

Summary:

The aim of this proposal is to integrate, extend and supplement a cooperative group of surface science techniques to enable both national and international collaborative research projects on the growth and characterisation of magnetic metal films and low dimensional structures. Magnetic multilayers exhibit unusual magnetic properties so research will lead to new applications and spin controlled devices. An understanding of the growth and nature of low dimensional structures is required for the development of electronic circuits close to the quantum limit. The development of the related facilities will ensure an Australian participation in research with a significant potential for device application.

The University of Newcastle

LE0668510 Dr PC Dastoor; Prof J O'Connor; Dr EJ Wanless; Dr MW Radny; Prof RN Lamb; Dr P Meredith; A/Prof MJ Ford; Dr GE Gadd; Dr PJ Evans; Prof GG Wallace; Dr PC Innis; Dr AI Minett; Dr JR Reimers; Prof MJ Crossley; Em/Prof NS Hush; Dr K Ostrikov; Prof DR McKenzie

Title: Nanostructure Deposition Facility

2006 : \$180,240

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisation(s)

The University of Newcastle
The University of Queensland
The University of Sydney
University of Wollongong
ANSTO

The University of New South Wales
University of Technology, Sydney

Administering Institution: The University of Newcastle

Summary:

Nanotechnology is one of the most rapidly developing research areas in Australia and yet facilities for nanofabrication are extremely limited. The Nanostructure Deposition Facility (NDF) is a unique facility, providing access to the highly specialised deposition equipment required to fabricate nanostructured surfaces from a variety of materials. These surfaces are in high demand by researchers from a range of disciplines who wish to exploit their unique material and electronic properties for a variety of applications. The NDF represents a major new joint venture between seven Australian institutions supporting research in areas such as organic electronics, atom optics, biotechnology and nanotechnology.

2403 : ATOMIC AND MOLECULAR PHYSICS; NUCLEAR**The University of Melbourne**

LE0668428 Prof GN Taylor; Dr E Barberio; A/Prof ME Sevier; Dr SN Tovey; Dr KE Varvell; A/Prof LS Peak; Prof AB Rozenfeld

Title: Support for the Australian Experimental High Energy Physics Program

2006 : \$295,000

Category: 2403 - ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PHYSICS

Partner Organisation(s)

The University of Melbourne
The University of Sydney
University of Wollongong

Administering Institution: The University of Melbourne

Summary:

High energy particle physics studies the most fundamental constituents of matter. This microscopic frontier requires the highest energy and highest intensity particle accelerators. Through the Big Bang model, high energy physics also sheds light on the development of the very early Universe. It is thus crucial for the understanding of nature at the very largest scales as well as the very smallest. The ATLAS and Belle experiments probe two of the most significant questions in fundamental physics: what is the origin of mass and why do we live in a universe comprising matter rather than a mix of matter and anti-matter? Support is sought to maintain access to the international high energy physics program in Europe and Japan.

2404 : OPTICAL PHYSICS

Swinburne University of Technology

LE0668398 Prof P Hannaford; Prof A Sidorov; Dr BV Hall; Dr AM Akulshin; Prof HA Bachor; Dr P Lam; Dr JD Close; Dr CC Harb; Dr CJ Vale

Title: Advanced Microwave Facility for Quantum-Atom Optics

2006 : \$177,900

Category: 2404 - OPTICAL PHYSICS

Partner Organisation(s)

Swinburne University of Technology
The Australian National University
The University of Queensland

Administering Institution: Swinburne University of Technology

Summary:

A portable facility will be based on state-of-the-art microwave (MW) and radiofrequency (RF) equipment that enhances our ability to create, control and characterise new multi-particle quantum states for the study of quantum-atom optics. It will involve a network of MW and RF devices that will form a versatile facility easily adaptable to particular experiments in different projects, and will be transportable to allow sharing between the three partner institutions. This facility will enable us to perform experiments on Bose-Einstein condensates including quantum entanglement of light and matter that capitalises on recent advances in quantum-atom optics to maintain our international competitiveness.

2405 : CLASSICAL PHYSICS

The University of New South Wales

LE0668481 Dr HH Kleine; A/Prof SL Gai; Prof MM Bilek; Dr J Howard; Prof Dr JC Lai; Dr RR Boyce; Dr K Shankar

Title: Time-resolved observation of highly transient events by a novel digital high-speed camera

2006 : \$140,385

Category: 2405 - CLASSICAL PHYSICS

Partner Organisation(s)

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

Administering Institution: The University of New South Wales

Summary:

The adequate investigation of highly transient events is a formidable challenge in various scientific areas, one of the largest obstacles being the lack of adequate equipment to visually capture such events. This is expected to change dramatically with the advent of a novel digital high-speed camera, which can take up to one million frames per second in unprecedented clarity. This camera would open avenues into so far impossible or difficult to conduct research on highly transient phenomena in various research fields, which include (but are not restricted to) fluid mechanics, plasma physics, combustion, and fracture mechanics. The camera will be instrumental in the development of new technologies in and beyond the mentioned research areas.

2499 : OTHER PHYSICAL SCIENCES

La Trobe University

LE0668482 Dr AG Peele; A/Prof PJ Pigram; Dr N Brack; A/Prof J Liesegang; Dr BD James; A/Prof SG Crewther; Dr GL Kelly; Dr MR Barnett; Prof YS Morsi; Prof DV Nicolau

Title: X-ray micro-tomography facility

2006 : \$485,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Partner Organisation(s)

La Trobe University
Deakin University
Swinburne University of Technology
VCAMM Ltd
LM Electroplating Ind. Pty Ltd

Administering Institution: La Trobe University

Summary:

The aim of this facility is to integrate a new x-ray micro-tomography facility with the existing surface analysis capacity at La Trobe University to create a unique capability to analyse physical structure and chemical makeup of a sample. The high-resolution capability makes the instrument a vitally useful one for imaging micro-structures. Moreover, the facility will benefit the rapidly growing cohort of researchers who require an in-depth understanding of the interplay between the position and composition of an interface. The wide diversity of planned projects will foster interdisciplinary research collaborations between the investigators thus strengthening their research in scope and depth.

The Australian National University

LE0668019 A/Prof TJ Senden; A/Prof MA Knackstedt; Prof WV Pinczewski; Prof ST Hyde; Dr A Sakellariou; Dr AP Sheppard; Dr V Robins; Dr CH Arns; Dr T Aste; Dr RM Sok; Dr A Limaye; Dr Y Cinar

Title: **An Advanced Computed Tomography Facility - high capacity and high resolution for dynamic studies in porous and granular materials.**

2006 : \$240,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Partner Organisation(s)

The Australian National University
The University of New South Wales

Administering Institution: The Australian National University

Summary:

The ANU/UNSW collaboration, via ARC LIEF funding in 2002, developed a world class X-ray tomography facility and an internationally recognised program in the emerging discipline of measurement, characterization and modelling of complex materials at high resolution in 3D. Results from this collaboration have driven design concepts for new materials and assisted in understanding properties of complex real world materials. The facility is in very high demand and there is an urgent need to extend the capacity of the facility. Upgrades based on recent technological advances will also provide the ability to explore time-resolved tomography. This will further extend the applications of this emerging technology to problems of national importance.

The University of Melbourne

LE0668017 A/Prof F Separovic; A/Prof M Aguilar; Prof L Tilley; Prof JS Van Deventer; Dr GC Lukey; A/Prof PR Gooley; A/Prof GJ Bryant; Dr A Clayton; Dr S Rochfort

Title: **Membrane Protein Structure and Interaction Facility**

2006 : \$1,047,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Partner Organisation(s)

The University of Melbourne
Monash University
La Trobe University

Administering Institution: The University of Melbourne

Summary:

Membrane proteins represent the next significant challenge in structural biology. This application seeks to establish a Membrane Protein Structure and Interaction Facility to create a network of cutting-edge technologies across three Melbourne Universities for the study of the structure and interactions of membrane proteins. The consortium comprises a group of researchers with complementary expertise in a range of techniques for studying membrane interactions, including biosensor, fluorescence and NMR technologies. The Facility will enhance membrane research through the purchase of a surface plasmon resonance based biosensor, a dual polarisation interferometer, a fluorescence correlation microscope and 600 MHz solid-state NMR spectrometer.

2501 : PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Griffith University

LE0667984 Prof GA Hope; Dr DJ Bernhardt; Dr MI Jeffrey; A/Prof PM Fredericks; A/Prof RL Frost

Title: Near Excitation Raman Micro Spectrometer

2006 : \$210,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Griffith University
Monash University
Queensland University of Technology

Administering Institution: Griffith University

Summary:

Characterisation of nanoparticulate materials is pivotal to understanding the way these materials form and function. Information on their structural properties can be obtained by a few techniques. Only near excitation Raman spectroscopy, neutron scattering and X-ray scattering can be used in-situ. The latter two require nuclear reactors or high energy particle fluxes to be useful, while near excitation Raman spectroscopy can be used routinely in the laboratory to characterise nanoscale chalcogenides, carbons, polymers, minerals and biomaterials. This ability underpins rapidly evolving research in nanotechnology and biotechnology, enabling the development of better pharmaceuticals, paints, medical diagnostics and semiconductor devices.

LE0668477 Prof RJ Quinn; Prof Z Xu; Dr SE Boyd; Dr GK Pierens; Dr WA Loughlin; Prof PC Healy

Title: Upgrade of existing university low field and high field nuclear magnetic resonance facilities

2006 : \$350,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Griffith University
AstraZeneca Pty Ltd

Administering Institution: Griffith University

Summary:

Griffith University is renowned internationally for its work in the field of Biodiscovery and the fields of Soil and Forestry Science. The Eskitis Institute for Cell and Molecular Therapies and the Centre for Forestry and Horticultural Research (CFHR) are two Research Centres instituted by the University to consolidate and promote growth in these key research areas. NMR Spectroscopy is one of the most important diagnostic tools in the chemical and biological sciences and is central to needs of both research clusters. The funds awarded here will enable the upgrade of Griffith's aged research instruments to state-of-the-art performance, thus ensuring ongoing international competitiveness in our established areas of research excellence.

Monash University

LE0668403 Prof D McNaughton; Prof H Schmidt; Dr J Beardall; Prof GB Deacon; Dr L Spiccia; Dr BR Wood; Dr PR Heraud; Dr SJ Langford; Prof MN Clayton; Prof AO Trounson; Prof KS Murray; A/Prof PC Junk; Dr TA Smith; A/Prof PC Mulvaney; Dr M Rowley; Prof M Forsyth; A/Prof ML Gee

Title: Enhanced micro-Raman and Fluorescence spectroscopy and imaging facility for biosystems and

2006 : \$570,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Monash University
The University of Melbourne

Administering Institution: Monash University

Summary:

State-of-the-art Raman mapping and imaging equipment integrated with an atomic force microscope (AFM) will provide enabling technologies for cutting-edge research in disease diagnosis, mapping of the distribution and interactions of pharmaceuticals in cells, understanding intracellular signalling molecules and nanomaterials research. A flexible micro-Raman spectrometer (sub-micron spatial positioning and micron spatial resolution) will be interfaced to an AFM head to enable nanometre spatial resolution for imaging/mapping at the sub-cellular level. Complementary new-generation total internal reflection and time-resolved fluorescence microscopy facilities will provide an integrated world-class equipment platform.

The Flinders University of South Australia

LE0668489 Dr MR Johnston; Prof JA Carver; Prof HJ Griesser; Prof KP Wainwright; Prof JG Matisons; Dr NH Voelcker; Dr GW Booker; A/Prof GP Jones; Prof JH Bowie; A/Prof NR Choudhury; Prof RA McKinnon; Prof JC Wallace; A/Prof ML Whitelaw; Dr MV Perkins; Dr SM Pyke; Prof SF Lincoln; Dr GM Elsey

Title: South Australian NMR Infrastructure Consortium

2006 : \$800,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The Flinders University of South Australia
The University of Adelaide
University of South Australia
The Australian Wine Research Institute

Administering Institution: The Flinders University of South Australia

Summary:

Nuclear Magnetic Resonance (NMR) spectroscopy is the most powerful spectroscopic technique for structural characterisation of molecules. To maximise research output, a South Australian NMR Infrastructure Consortium, is proposing significant consolidation of NMR infrastructure within the state to provide a framework to support research across a wide range of disciplines. We are proposing the purchase of four items of NMR infrastructure, to be located at three key locations across Adelaide. This infrastructure will bring South Australia into line with other states in Australia as regards this critical resource. Applications include nanotechnology, protein and peptide structure and function, metabonomics and materials science.

The University of Newcastle

LE0668449 Dr SW Donne; Prof GA Lawrance; Dr RC Burns; A/Prof EM Kennedy; Prof BZ Dlugogorski; Dr GV Franks; Dr PG Lye; Dr TC Brown; Dr PS Thomas; A/Prof AS Ray

Title: Advanced Surface and Porosity Characterization Facility

2006 : \$158,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Newcastle
The University of New England
University of Technology, Sydney
Particle and Surface Sciences, Pty Ltd

Administering Institution: The University of Newcastle

Summary:

The aim of this facility is to characterize the surface chemistry and porosity of solid materials used in many varied applications such as batteries, heterogeneous catalysis, minerals processing, cement and ceramics. Each of these research fields represents a significant national and international industry, and so successful outcomes using this facility could potentially be of considerable technological as well as economic benefit. The outcomes expected from this facility are in line with the Frontier Technologies -- Advanced Materials priority area of research, in that new and advanced materials with superior performance will be developed and applied to processes within these industries.

The University of Queensland

LE0668521 A/Prof IR Gentle; Prof GM Lu; Prof M Trau; Prof J Drennan; Prof AK Whittaker; A/Prof JL Martin; A/Prof RL Frost; Dr JT Klopogge; Dr CL Brown

Title: Small Angle Scattering Facility for the Materials and Biological Sciences

2006 : \$300,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Queensland
Queensland University of Technology
Griffith University

Administering Institution: The University of Queensland

Summary:

Small angle X-ray scattering is recognised as a central characterisation method for disperse systems. Such systems, which include emulsions, proteins in solution, colloids, polymers, porous materials and mineral dispersions are ubiquitous and cover a number of priority research areas for the three universities involved. This proposal aims to purchase a state of the art research instrument and associated accessories which will be located, supported and maintained in Brisbane Surface Analysis Facility, and made available to researchers from all three institutions, their collaborators and industry users.

The University of Sydney

LE0668439 Prof Dr T Maschmeyer; Prof PA Lay; A/Prof SH Kable; A/Prof PH Karuso; Dr DB Gore; Dr KM Downard; Dr MD McLeod; Dr KA Jolliffe; Prof GA Johnston; Dr JR Hanrahan; Dr KJ Fisher

Title: **Elemental and Structural Analysis Facility Comprising a FTICR Mass Spectrometer and a CHNS**

2006 : \$730,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Sydney
Macquarie University

Administering Institution: The University of Sydney

Summary:

The aim of this facility is the synergistic analysis of elemental composition and molecular formula of a large variety of chemical substrates. Without such determinations chemical research is incomplete and rendered unpublishable. The high resolution and mass accuracy of the FTICR mass spectrometer allows many aspects of chemical structure and composition to be determined. It may also be used to study dissociation processes, bond energies and reactivity of ions that gives further insight into molecular structure. Often parallel examination with a CHN&S analyser is necessary to determine the purity of the bulk sample and to analyse samples not suitable for mass spectrometry.

2502 : INORGANIC CHEMISTRY**The University of Sydney**

LE0668302 Dr CD Ling; Dr BJ Kennedy; Dr SA Schmid; Dr R Robinson; Dr C Curfs; Prof TR Welberry; Prof RL Withers; Dr AP Stampfl

Title: **Floating-zone Crystal Growth Facility**

2006 : \$210,000

Category: 2502 - INORGANIC CHEMISTRY

Partner Organisation(s)

The University of Sydney
ANSTO
The University of Newcastle
The Australian National University

Administering Institution: The University of Sydney

Summary:

We propose to obtain and install Australia's first optical floating-zone furnace, as the centrepiece of an integrated facility uniquely capable of growing large (cm-scale) single crystals of many advanced materials such as high-temperature superconductors. Large single crystals are required to fully characterise their chemical, electrical, magnetic, and mechanical properties. Moreover, they are crucial for sophisticated experiments at neutron and synchrotron X-ray sources; therefore, Australia's ongoing \$500M+ investment in the construction of such sources makes this proposal very timely. The proposed facility will remove Australian researchers' dependence on overseas collaborations to access state-of-the-art crystal growth apparatus.

2503 : ORGANIC CHEMISTRY**University of Wollongong**

LE0668374 Prof SG Pyne; Prof G Otting; A/Prof WE Price; Dr SJ Blanksby; Prof JB Bremner; A/Prof PA Keller; Dr SF Ralph; Prof CJ Easton; Prof MG Banwell; Dr MG Casarotto; Prof AF Dulhunty; Prof PG Board

Title: **State-of-the-art NMR Facilities**

2006 : \$470,000

Category: 2503 - ORGANIC CHEMISTRY

Partner Organisation(s)

University of Wollongong
The Australian National University

Administering Institution: University of Wollongong

Summary:

Nuclear magnetic resonance spectroscopy is an essential tool for molecular structure elucidation and is a rapidly developing technology. This proposal is for a new 400 MHz NMR spectrometer and a LC-NMR system at the University of Wollongong and a cryogenic detection system for the 600 MHz NMR at the Australian National University. The latter will significantly increase sensitivity and thus shorten acquisition times dramatically. The former items will provide the capacity to analyse different compounds (e.g. phospholipids, paramagnetic proteins) and complex mixtures of natural or synthetic origin. The new enhanced facilities will substantially increase productivity and collaborations in the areas of drug discovery and structural biology.

2504 : ANALYTICAL CHEMISTRY

Curtin University of Technology

LE0668452 Prof RI Kagi; Prof R Alexander; A/Prof K Grice; Dr JJ Brocks; A/Prof EL Ghisalberti; A/Prof RD Trengove; Dr CF Vernon; Dr A Heitz; Dr PF Greenwood; Dr CA Joll; Dr B Warton; Dr FM Busetti

Title: **A research grade liquid chromatograph - mass spectrometer for quantitative analysis of trace organic analytes in complex matrices**

2006 : \$290,000

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

Curtin University of Technology
The University of Western Australia
The Australian National University
Murdoch University
CRC for Water Quality and Treatment
Water Corporation of WA
Centre for Groundwater Studies
CSIRO Minerals

Administering Institution: Curtin University of Technology

Summary:

This proposal seeks \$300K (57%) support from the ARC for a research grade triple quadrupole HPLC-MS for Western Australia. The proposal has cash and in-kind support from the three WA research universities. The existing strong collaborative arrangements between the host university (Curtin) and local, national and international researchers and research users means the investment will have high impact in supporting quality, high benefit research and research training of a substantial number of graduate students. Issues which the new facility will address include potable water quality, water re-use, environmental contamination and site remediation, petroleum exploration and production, and natural products and bioprospecting studies.

Monash University

LE0668525 Dr BF Schaefer; Dr RJ Morrison; Dr SD Kolev; Dr MR Grace; Dr G Mark; A/Prof I Cartwright; Dr IS Buick; Dr ID McKelvie; Dr AL Chaffee; Dr R Beckett; Dr AI Mechler

Title: **A state-of-the-art trace element and speciation analysis facility for the Earth, Environmental and Chemical Sciences**

2006 : \$250,000

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

Monash University
The University of Melbourne

Administering Institution: Monash University

Summary:

The proposed facility aims to integrate cutting edge analytical techniques to measure both the abundance and molecular species of key trace elements. Such analytical methods have applications in earth (metallogenesis and crustal evolution), environmental (groundwater, pollutant transport and nutrification of water resources) and chemical (laser cleaning, organometallic compound characterisation and ablation kinetics) sciences. Such an integrated facility will support international profile ARC funded research in addition to applied environmental and nanotechnology research relevant to Australian industry and quality of life.

Murdoch University

LE0668536 Prof RP Oliver; A/Prof RD Trengove; Prof AC Thompson; Prof R Appels; Prof IC Potter; A/Prof DW Pethick; Dr SA Reid; Dr PB Spencer; Prof S Smith; Prof CA Atkins; Dr KW Dixon; A/Prof EL Ghisalberti; Dr AH Millar; Prof RL Hurlle; A/Prof TJ Edwards; Dr EF May; Dr B Warton; Dr B van Aarssen; Dr WM Best

Title: **Western Australian Facility for High Throughput Biological and Organic Gas Chromatography-Mass Spectrometry**

2006 : \$485,000

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

Murdoch University
The University of Western Australia
Curtin University of Technology
Botanic Gardens and Parks Authority
Epicchem Pty Ltd

Administering Institution: Murdoch University

Summary:

Separation, identification and quantification of molecules are critical steps in the understanding of biological, geochemical and synthetic organic chemical processes. GC-MS is the method of choice for small molecules. New developments include just-in-time derivatisation for increased sample throughput, increased molecular mass range, 2 dimensional GC for better separation, QQQ MS for better identification, and enhanced data handling software. Acquisition of this equipment will transform capabilities for a broad range of biological, geochemical and chemical projects that include metabolomic analyses of smoke-induced plant germination, plant development, fungal-plant interactions, drug-discovery, animal nutrition and conservation.

The University of Queensland

LE0668543 A/Prof MJ Garson; Dr SE Bottle; Prof MJ Gidley; Prof PN Shaw; Dr JJ De Voss; Dr JT Blanchfield; Prof I Toth

Title: **A high resolution, high-throughput chromatographic system for separation and characterisation of complex samples**

2006 : \$280,000

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

The University of Queensland
Queensland University of Technology

Administering Institution: The University of Queensland

Summary:

The requested chromatographic facility comprises equipment for the separation and chemical characterisation of complex samples. This instrumentation will enhance existing infrastructure for studying chemical characteristics of microbes, plants, animals, foodstuffs and pharmaceuticals by improving the analytical power and speed required for detailed sample analysis. The mass detector selected has accurate mass capability for compound identification and can be used for quantitative work in the submicromolar range. Establishment of this joint chromatography facility will enhance existing research linkages between the two universities involved.

University of Tasmania

LE0668471 Prof PR Haddad; Prof MG Clark; Prof JB Reid; Dr AR Bowie; Dr M Macka; Prof TA McMeekin; Dr JP Bowman; Dr JJ Ross; Dr MC Breamore; Dr EF Hilder; Dr RM Guijt; Dr RA Shellie; Dr GA Jacobson

Title: **Hyphenated Capillary Electrophoresis - Mass Spectrometry Facility**

2006 : \$262,706

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

University of Tasmania

Administering Institution: University of Tasmania

Summary:

This proposal is for a Capillary Electrophoresis-Mass Spectrometer capable of identifying and characterising a wide range of molecules of biological, pharmaceutical and forensic interest. It will consolidate existing collaborations between the Australian Centre for Research on Separation Science (ACROSS) and researchers within the University of Tasmania as well as with the Australian Federal Police (AFP). The requested instrumentation will facilitate internationally competitive research in areas of national and international significance, particularly in areas related to human health and national security, and research outcomes will have direct social and financial benefits for Australia.

2505 : MACROMOLECULAR CHEMISTRY

The University of New England

LE0668038 Dr CM Fellows; Dr C Barner-Kowollik; Dr M Stenzel; A/Prof K Fujimori; Dr L Barner; A/Prof SA Glover; Prof TP Davis; Dr MJ Monteiro; A/Prof PJ Halley

Title: From Fundamentals to Complex Architecture in Free-Radical Polymerisation: Designing Future Generations of Macromolecular Materials

2006 : \$175,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Partner Organisation(s)

The University of New England
The University of New South Wales
The University of Queensland

Administering Institution: The University of New England

Summary:

In order to control the properties of a material, it is necessary to know how it is made. Preparation of the coming generations of intelligent polymer materials- materials of highly controlled structure, responsive to their environment, with an even broader range of applications than existing polymers- requires precise information on the speed of rapid molecular processes. The instrumentation outlined in this project will make it possible to determine values for more rapid processes, at a higher level of accuracy, than previously possible in Australia, enabling the design and synthesis of future generations of materials.

The University of Sydney

LE0668496 Prof J Trehwella; A/Prof PM Curmi; Dr BC Mabbutt; Prof GG Warr; Prof HW Stokes; A/Prof R Cavicchioli

Title: Facility for Structural Analysis of Bio-Molecular Complexes and Self Assembly

2006 : \$950,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Partner Organisation(s)

The University of Sydney
The University of New South Wales
Macquarie University

Administering Institution: The University of Sydney

Summary:

The research accomplished using this Facility will lead to advances in three key areas: (1) understanding regulatory mechanisms essential to healthy biological function as a foundation for treating the many diseases whose molecular pathology represents a break down in cellular regulation; (2) determining protein structures from microbes that teach us about adaptation in diverse environments and provide opportunities for innovative biotechnology applications; (3) elucidating membrane protein structures and the principals of self assembly in biology and in synthetic polymer systems for breakthrough understanding of how to control self assembly for applications in medicine, agriculture, food, and new materials.

2506 : THEORETICAL AND COMPUTATIONAL

The University of Adelaide

LE0668520 Prof AG Williams; A/Prof MA Buntine; Dr PD Coddington; A/Prof DB Leinweber; Dr FA Vaughan; Dr CA Abbott; Prof JH Bowie; Prof MI Bruce; Prof DE Catcheside; Prof GC Dandy; Dr J Denier; Prof GB Fincher; A/Prof AR Gerson; Prof CH Hansen; Prof P Langridge; Prof WD Lawrance; Prof SF Lincoln; Dr GF Metha; Prof TM Monro

Title: South Australian Supercluster Facility

2006 : \$560,000

Category: 2506 - THEORETICAL AND COMPUTATIONAL CHEMISTRY

Partner Organisation(s)

The University of Adelaide
South Australian Partnership for Advanced
The Flinders University of South Australia
University of South Australia

Administering Institution: The University of Adelaide

Summary:

The South Australian Supercluster Facility is a state of the art, two Teraflop, cluster-based computing facility that will be dedicated to making major new advances in computational chemistry, bioinformatics, gene sequencing, plant functional genomics, water resources management, fluid dynamics, photonics, and challenging optimisation problems in science and engineering including network design for communications, electricity and water networks. It will be managed by SAPAC on behalf of the South Australian research community.

University of Technology, Sydney

LE0668467 Prof LC Botten; Prof RC McPhedran; Prof L Radom; Prof CM Stampfl; Dr RJ Bursill; Prof E Leonardi; A/Prof RS Womersley; Prof AJ Pitman; A/Prof TR Marchant; A/Prof MJ Ford

Title: A large memory, high performance computing system for the ac3 Research Consortium

2006 : \$620,000

Category: 2506 - THEORETICAL AND COMPUTATIONAL CHEMISTRY

Partner Organisation(s)

University of Technology, Sydney
The University of Sydney
The University of New South Wales
Macquarie University
University of Wollongong
ac3

Administering Institution: University of Technology, Sydney

Summary:

Computational simulation and modelling is a critical element in the advancement of knowledge in science and technology, with cutting-edge research requiring teraflop capacity infrastructure. Presently, ac3's access to systems of appropriate capability is limited, hampering research progress in intensely competitive fields. The proposed large memory, teraflop system will boost local access to genuine supercomputing capability ten fold, complement the APAC National Facility, and support ARC projects in chemistry, photonics, materials science and nanotechnology, mathematics, physics, engineering and earth systems, many of which are directed towards national priorities in frontier technologies and Australian environmental sustainability.

2599 : OTHER CHEMICAL SCIENCES

Queensland University of Technology

LE0668513 Prof L Morawska; Dr ZD Ristovski; Dr GA Ayoko; Dr NS Holmes; Prof MR Moore; A/Prof BN Noller; A/Prof JC Ng; Mr DL Gilbert

Title: Time of Flight Aerosol Mass Spectrometer for Research on Airborne Particles and their impact on Health and the Environment

2006 : \$280,000

Category: 2599 - OTHER CHEMICAL SCIENCES

Partner Organisation(s)

Queensland University of Technology
The University of Queensland
Queensland Government

Administering Institution: Queensland University of Technology

Summary:

The Time of Flight Aerosol Mass Spectrometer (TOF-AMS) provides real time, in field chemical characterisation of nanometre size aerosols as a function of particle size. It revolutionises studies of the dynamics of atmospheric processes and enables insight not previously possible using classical sampling methods and laboratory processing. TOF-AMS will be used for cutting edge studies on atmospheric processes, with application towards environmental sustainability, human health and efficiency enhancement of industrial and energy generation processes. It will provide in depth knowledge on the relationship between environmental impacts of emissions, human exposures and health effects and thus scientific background for risk prevention.

2601 : GEOLOGY

The University of Western Australia

LE0668377 Dr Z Li; Prof ME Barley; Prof PA Cawood; A/Prof LB Collins; A/Prof MC Dentith; Dr IC Fitzsimons; A/Prof DW Haig; Dr SA Pisarevsky; Dr SM Reddy; Dr MT Wingate; Dr K Wyrwoll; Dr ZQ Chen; Dr IM Tyler

Title: Western Australia Palaeomagnetic and Rock-magnetic Facility

2006 : \$246,000

Category: 2601 - GEOLOGY

Partner Organisation(s)

The University of Western Australia
Curtin University of Technology
OTHER (Geological Survey of WA)

Administering Institution: The University of Western Australia

Summary:

Palaeomagnetism is a crucial tool for reconstructing the past positions of continents during the Earth's history. In combination with rock-magnetic studies, it has a wide range of applications in ore genesis studies, environmental studies, soil research, and geophysical exploration. This proposal is for the addition of critical rock magnetic instruments to the WA Palaeomagnetic and Rock-magnetic Facility, and the upgrading of the existing 2G magnetometer into a DC-SQUID system which is an order of magnitude more sensitive than the existing model. This will ensure the WA laboratory remains capable of conducting a full range of magnetic analyses, so that Australian researchers remain internationally competitive.

2602 : GEOPHYSICS**The Australian National University**

LE0668155 Prof BL Kennett; Dr GS Heinson; Prof SY O'Reilly

Title: Instrumentation for combined seismic and electromagnetic Earth sounding

2006 : \$350,000

Category: 2602 - GEOPHYSICS

Partner Organisation(s)

The Australian National University
The University of Adelaide
Macquarie University

Administering Institution: The Australian National University

Summary:

A set of 15 new geophysical recorders, with broad frequency response, will be used in remote locations for high definition seismological and electromagnetic investigations that will enhance probing of the Australian continent. The recorders will introduce joint seismic and electromagnetic sounding to Australia to elucidate both the physical and chemical characteristics of the Earth.

2603 : GEOCHEMISTRY**The Australian National University**

LE0668345 Dr JJ Brocks; Prof GD Farquhar; A/Prof K Grice; Dr RR Haese; Dr R Shalliker

Title: A highly sensitive mass spectrometer for trace analysis of biomarker molecules to study changes in recent and ancient environments

2006 : \$390,700

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

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

Administering Institution: The Australian National University

Summary:

Earth and life influence each other in profound ways. Understanding these processes that link geology and biology is crucial to predict and direct the future of our environment. To establish a new research group studying the interface between life and the environment we request funds for a high-end mass spectrometer for the identification of traces of biomarker molecules. The biomarkers extracted from recent and ancient lake sediments, estuaries, sea beds and soils will yield additional insight regarding the state and history of Australian ecosystems. The research will help us to understand and reduce toxic cyanobacterial blooms, extreme anoxia, contamination of reservoirs by run-off water and anthropogenic contamination of soil.

The University of Melbourne

LE0668226 Dr JD Woodhead; A/Prof JM Hergt; Dr MW Wallace; Prof IA Nicholls; Prof RA Cas; Dr IS Buick

Title: A new X-ray spectrometer facility for VIEPS: major and trace element characterisation of geological

2006 : \$186,000

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

The University of Melbourne
Monash University

Administering Institution: The University of Melbourne

Summary:

The acquisition of major and trace element data remains the most fundamental requirement in any attempt to characterise geological and environmental materials. Until 2001, the earth sciences departments of Melbourne and Monash universities had ready access to an X-ray Fluorescence facility for generating such data. This facility is now unavailable. As a result we urgently seek a next generation ED-XRF instrument to provide high-quality analytical data across a wide spectrum of earth and environmental science sub-disciplines. The facility will enhance existing research programs, improve our research training capabilities, and promote new and innovative research directions.

2606 : ATMOSPHERIC SCIENCES

University of Wollongong

LE0668470 Prof DW Griffith; Dr NB Jones; Dr SR Wilson; Prof PO Wennberg; Dr D Chen

Title: High resolution Fourier transform infrared spectrometer for atmospheric remote sensing and laboratory spectroscopy

2006 : \$250,000

Category: 2606 - ATMOSPHERIC SCIENCES

Partner Organisation(s)

University of Wollongong
The University of Melbourne
California Institute of Technology

Administering Institution: University of Wollongong

Summary:

The Atmospheric Chemistry Research Group, with strong national and international collaboration, carries out active and diverse programmes in remote sensing of the atmosphere, atmospheric chemistry, greenhouse gases, stratospheric ozone and climate change research. This research is focussed on developing and using novel and modern spectroscopic techniques to continually improve measurement capabilities, and requires state-of-the-art instrumentation to be internationally competitive. The central piece of major equipment on which our research relies, a high resolution Fourier Transform Infrared spectrometer, requires urgent replacement to fulfil existing commitments and meet new measurement challenges.

2701 : BIOCHEMISTRY AND CELL BIOLOGY

The University of Queensland

LE0668241 Prof TJ Gonda; Dr BG Gabrielli; Dr SM Grimmond; Dr SC Barry; Prof PF Bartlett; Dr JP Whitehead; Prof M Crossley; Dr RW Johnstone; A/Prof EA Musgrove

Title: A Facility for High-Throughput, Functional Gene Discovery Using Arrayed Retroviral Expression

2006 : \$824,610

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Queensland
The University of Adelaide
The University of Sydney
Peter MacCallum Cancer Institute
Garvan Institute of Medical Research

Administering Institution: The University of Queensland

Summary:

Little or nothing is known of the functions of more than half of the ~30,000 genes revealed by the sequencing of the human genome. We propose to establish a unique facility that will allow identification of genes based on their ability to confer particular properties on a cell of interest, using a new implementation of an approach called retroviral expression cloning. The size of the genome dictates that robotics and other high-throughput equipment, which form the subject of this application, be used in this endeavour. The facility will present scientists with unique research opportunities based on the identification of genes that regulate a broad range of biological processes, including many of major fundamental and biomedical importance.

LE0668526 A/Prof RJ Lewis; Dr JD Hooper; Dr DL Pountney; Prof JF Hancock; Prof RJ Capon; Prof Dr MJ Waters; Prof R Minchin; Dr BA Reynolds; Prof P Timms; Dr SE Bottle; Prof JA Clements; Prof NW Johnson

Title: **Biomolecular discovery and analysis facility**

2006 : \$542,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Queensland
Queensland University of Technology
Griffith University

Administering Institution: The University of Queensland

Summary:

Taking advantage of the genomics explosion, the proposed Biomolecular Discovery and Analysis Facility will link chemists and biologists interested in understanding and manipulating signalling pathways associated with important biological and disease processes. High content cell visualisation data will be distributed to three nodes, providing all users with direct access to advanced analysis and validation tools. Anticipated outcomes include:

- identification and characterisation of novel biological pathways
- accelerating and value-adding to biomolecular discovery
- enhancing research capacity in the biomedical sciences

Our three institutions are ideally placed to link chemistry and biology with this technology.

LE0668382 A/Prof JL Martin; A/Prof IR Gentle; A/Prof CJ Kepert; Dr P Turner; Dr JM Guss

Title: **e-Research Infrastructure for the Molecular and Materials Structure Sciences**

2006 : \$1,000,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Queensland
The University of Sydney

Administering Institution: The University of Queensland

Summary:

Atomic detail visualisation of the structures of biomolecules, chemical materials and surfaces is critical to their rationalisation and exploitation. Equipment is sought for the first phase of a national e-Research development program being undertaken by the ARC Molecular and Materials Structure Network. Three world-class structural facilities will pilot the deployment and development of workflow automation and collaborative remote access services. Automation will maximise experiment reach and sample throughput, and offers the remote user independence while minimising on-site staff involvement. Remote-access services will enable e-Research with remote sample assessment, data collection, processing, visualisation, analysis and collaboration.

The University of Sydney

LE0668479 Prof NJ King; Prof IW Dawes; Prof LM Khachigian; Prof KW Beagley; Prof IL Campbell; Prof DI Cook; Prof J Black; Prof G Halliday; Prof JW McAvoy; Prof NH Hunt; Dr PW Gunning; Prof JD Pollard; Prof M Murray; Prof WJ Britton

Title: **Advanced Imaging Flow Cytometry Facility for NSW**

2006 : \$265,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

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

Administering Institution: The University of Sydney

Summary:

This project aims to upgrade the flow cytometry facility at the University of Sydney to state-of-the-art research capability. This will upgrade this facility to cutting edge status in Australia and will substantially increase the research modalities available to NSW researchers using this facility. These new modalities will enable statistical investigative techniques, heretofore impossible, to be used on single cells, in particular, cells that are extremely rare in tissue. This will both broaden and strengthen a wide array of current projects and dramatically enhance the capacity for future research.

The University of Western Australia

LE0668413 A/Prof BJ Griffin; Prof LD Beazley; Dr PL Clode; Prof SA Dunlop; Prof L Faraone; Dr L Filgueira; Dr S Hinckley; Prof SP Klinken; Prof JJ Kuo; A/Prof NG Laing; Prof GM Parkinson; Prof Z Rengel; Dr M Saunders; A/Prof TG St Pierre; Prof SM Thurgate; Prof GC Yeoh; Prof A van Riessen

Title: The Nanoscale Characterisation Centre WA Analytical Biological Transmission Electron Microscope

2006 : \$723,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Western Australia
Curtin University of Technology
Murdoch University
Edith Cowan University

Administering Institution: The University of Western Australia

Summary:

An integrated digital analytical biological transmission electron microscopy (BioTEM) facility will be established in a successful regional microscopy centre, a product of long-standing collaboration between the partners. The BioTEM will service ongoing, high demands from diverse research groups including the four partner universities and the Western Australian Institute for Medical Research. It replaces 21yr old facilities supported by extensive sample preparation infrastructure and technical expertise. This current technology simplifies training and a key objective will be to provide a readily accessible path to high quality BioTEM data to an expanded user base and enable world class research.

2702 : GENETICS

James Cook University

LE0668450 Dr H Korner; Prof AG Baxter; Dr G Muench; Dr N Ketheesan; Prof R De Nys; A/Prof KD Pile; Prof RL Kennedy

Title: Upgrade of comparative phenotypical and functional cell analysis at James Cook University

2006 : \$150,000

Category: 2702 - GENETICS

Partner Organisation(s)

James Cook University

Administering Institution: James Cook University

Summary:

Investigation of the cellular phenotype of genetically different organisms is a major technology that is used in almost all aspects of biological sciences. For many projects at the Comparative Genomics Centre, and James Cook University in general, the access to a state-of-the-art flow cytometric analysis unit is the limiting factor. This application is initiated by the Comparative Genomics Centre, a novel research initiative at James-Cook-University and is intended to provide the opportunity for comprehensive cell analysis in comparative genomics and phenomics

The University of Adelaide

LE0668093 Prof A Cooper; A/Prof MP Schwarz; Prof SC Donnellan

Title: Expansion and enhancement of the South Australian Regional Facility for Molecular Ecology and Evolution and the Australian Centre Ancient DNA

2006 : \$115,000

Category: 2702 - GENETICS

Partner Organisation(s)

The University of Adelaide
The Flinders University of South Australia
South Australian Museum

Administering Institution: The University of Adelaide

Summary:

The South Australian Regional Facility for Molecular Ecology and Evolution and the Australian Centre for Ancient DNA operate as jointly managed facilities for researchers in South Australia who utilise genotyping technology for evolutionary, ecological, forensic and related studies. The first phase, funded by an ARC LIEF grant, provided high throughput genotyping and large-scale storage of biological material. In the second phase, we propose to expand PCR capacity and capabilities in support of existing high-throughput genotyping and advanced analytical methods for contemporary and ancient/fragmentary DNA. This equipment enhancement is essential for the expansion into the rapidly burgeoning area of ancient/fragmentary DNA

The University of Melbourne

LE0667981 Prof MB Renfree; Prof JA Graves; Dr SM Forrest

Title: Kangaroo Genome Resource Management Facility

2006 : \$200,000

Category: 2702 - GENETICS

Partner Organisation(s)

The University of Melbourne
The Australian National University
Australian Genome Research Facility

Administering Institution: The University of Melbourne

Summary:

The ARC Centre for Kangaroo Genomics (the Centre) consists of a dedicated team of scientists from five sites in Australia with expertise in comparative genomics, comparative molecular development, large scale sequencing and bioinformatics. This application is for the purchase and development of hardware and software for an information management system which is vital for efficiently storing, tracking and disseminating large amounts of data within the Centre, as well as between the Centre and its many national and international collaborators. The establishment of a Laboratory Information Management System (LIMS) is essential infrastructure for the success of this project.

The University of Newcastle

LE0668440 Prof RJ Scott; Prof IW Dawes; Prof RJ Trent; Prof NH Hunt; Prof PL Bergquist; Prof MS Baker; Prof PR Dunkley; Dr R Lin; Prof P Gibson; A/Prof AT Sim

Title: Advanced technology for transcriptomics, genomics and gene mapping

2006 : \$850,000

Category: 2702 - GENETICS

Partner Organisation(s)

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

Administering Institution: The University of Newcastle

Summary:

The aim of this proposal is to introduce the next generation of genome analysis tools to the Universities and Institutions engaged in molecular biological research. By acquiring the requested equipment the consortium will be able to offer state-of-the art facilities to all researchers who are interested in the molecular basis of variation both in healthy organisms and diseased. Importantly, the costs of undertaking this type of research will be significantly reduced by the acquisition of the equipment requested.

The University of Queensland

LE0668507 A/Prof BJ Carroll; Dr DJ Maclean; Dr PR Ebert; Prof M Trau; Prof MP Jennings; Dr PR Young; Prof RJ Henry; A/Prof LS Lee

Title: Real time PCR and nanoparticle diagnostic facilities for high-throughput quantitative analysis of genomic structure and gene expression

2006 : \$260,000

Category: 2702 - GENETICS

Partner Organisation(s)

The University of Queensland
Southern Cross University

Administering Institution: The University of Queensland

Summary:

In 1996, The University of Queensland (UQ) and Southern Cross University (SCU) were awarded ARC-RIEF funding for an "Advanced facility for detection and quantitation of PCR products by fluorescence". To update and extend this cutting-edge facility, an ABI-7900 384-well thermal cycler at UQ will enable high-throughput quantitation of gene abundance and gene expression, and a FC500 multiplate loader and multidetector flow cytometer at SCU will enable development of high-throughput nanoparticle technology for quantitation of multiple DNA fingerprints linked to genetic traits and genetic diversity. The equipment will make our research more competitive internationally and allow achievement of more effective outcomes much more efficiently.

2704 : BOTANY

The Australian National University

LE0668487 Prof MR Badger; Dr BJ Pogson; Adj/Prof CB Osmond; Dr DA Jones; Prof RE Williamson; Dr JR Evans; Dr S Von Caemmerer; Dr AB Nicotra; Dr C Linde; Dr U Mathesius; Prof MC Ball; Prof GD Farquhar; Dr J Masle; Dr RT Furbank; Dr MA Ayliffe; Dr DG Bonnett; Dr T Condon; Dr RG White; Dr RE Munns; Dr PJ Larkin

Title: **Plant Phenomics Imaging and Analysis Facility**

2006 : \$553,000

Category: 2704 - BOTANY

Partner Organisation(s)

The Australian National University
CSIRO Plant Industry

Administering Institution: The Australian National University

Summary:

This proposal seeks to establish a world class facility for plant phenomics analysis. The facility will provide an infrastructure framework for the development of growth and measurement systems allowing a comprehensive, continuous record and analysis of key physiological and growth parameters throughout the plant lifecycle, under field and laboratory conditions. New technologies will be implemented centred on automated systems that will allow non-destructive and destructive analysis of above and below ground parts of the plant throughout its lifecycle. These systems will include visual imaging of growth, chlorophyll fluorescence, spectral reflectance, and analysis of leaf photosynthetic gas exchange and metabolites.

2706 : PHYSIOLOGY

Monash University

LE0668435 Prof T Sridhar; Prof WP Anderson; Prof F Caruso; Prof K Hourigan; Prof JF Bertram; Dr JR Friend; Dr IS Harper; Dr LY Yeo; Dr RG Evans; Dr GM Forde; Dr HC Parkington; Dr RP Jagadeeshan; Prof BJ Oldfield; Ms J Carberry; Dr J Pearson; Prof J Sheridan; A/Prof MC Thompson; Dr KA Gross; Dr GG Qiao; A/Prof R Wetherbee

Title: **Biomedical Engineering Sensing and Imaging Facility**

2006 : \$1,300,000

Category: 2706 - PHYSIOLOGY

Partner Organisation(s)

Monash University
The University of Melbourne

Administering Institution: Monash University

Summary:

A major facility in biomedical engineering sensing and imaging is proposed. It will foster multidiscipline teams of medical and engineering researchers to develop innovative processes and technology for the prevention, diagnosis, and treatment of disease, for patient rehabilitation, and for improving health. The new facility will build on a number of existing research strengths and resources across the participating universities as well as the CSIRO and hospital-based research groups.

2707 : ECOLOGY AND EVOLUTION

Griffith University

LE0668008 Prof Z Xu; Prof SE Bunn; A/Prof SJ Lee; Prof WS Price; Prof JW Cairney; Dr RM Connolly; Dr MA Burford; Dr CS Fellows; Dr C Chen

Title: **Advanced stable isotope ratio mass spectrometer for investigations on carbon and nutrient cycling processes in terrestrial and aquatic ecosystems**

2006 : \$100,000

Category: 2707 - ECOLOGY AND EVOLUTION

Partner Organisation(s)

Griffith University
University of Western Sydney

Administering Institution: Griffith University

Summary:

Recent advances in stable isotope technologies, together with other advanced technologies (eg bio-molecular and NMR), have highlighted exciting opportunities for improving our understanding of important carbon and nutrient cycling as well as hydrological processes in terrestrial and aquatic ecosystems. This application seeks to purchase an advanced isotope ratio mass spectrometer for supporting and undertaking current and potential new first-class research projects in the relevant areas with the collaborating institutions. This will result in significantly improved understanding and management of the critical terrestrial and aquatic processes, particularly in the context of increasing economic, environmental and social benefits.

The University of New South Wales

LE0668039 A/Prof IM Suthers; Prof DJ Booth; A/Prof RG Harcourt; Dr EL Johnston; Dr BP Kelaher; Prof SL Kjelleberg; Prof JH Middleton; A/Prof BA Neilan; Dr AG Poore; A/Prof DA Raftos; A/Prof PJ Ralph; Prof PD Steinberg; Dr JE Williamson; A/Prof AR Davis; Prof DJ Ayre; Dr GF Birch; Dr M Byrne; Prof AD Short; A/Prof R Coleman; Prof AJ Underwood

Title: Sydney Harbour Institute of Marine Science (SHIMS) aquarium facility

2006 : \$160,000

Category: 2707 - ECOLOGY AND EVOLUTION

Partner Organisation(s)

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

Administering Institution: The University of New South Wales

Summary:

The proposed state-of-the-art aquarium facility will be the heart of the newly established Sydney Harbour Institute of Marine Science (SHIMS) at Chowder Bay, to investigate the links between catchments, ports and biodiversity. With superb water quality for rearing plants and animals, and safe access to the harbour and coastal environments, we will also be linked back to Sydney's research infrastructure, vastly enhancing the substantial ARC investment in local marine science. Four research themes addressed: 1) the ecology of ports and harbours, and the effects of pollutants, invasive species and eutrophication; 2) coastal oceanography and geomorphology, 3) biotechnology and bio-prospecting of key biota; and 4) urban fisheries science.

2801 : INFORMATION SYSTEMS

The University of Sydney

LE0668542 Prof D Feng; Dr W Cai; Dr Z Wang; Prof DE Everitt; Prof PD Eades; Prof DB Hoang; Prof RJ Gibson; Prof EA Edmonds; A/Prof M Piccardi; Dr VC Gay; Prof HR Wu; Dr J Wang; Prof ME Orłowska; Prof X Zhou

Title: Multimedia Computing, Production, Management and Distribution for HDTV and its Applications

2006 : \$425,000

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

The University of Sydney
University of Technology, Sydney
RMIT University
The University of Queensland

Administering Institution: The University of Sydney

Summary:

Multimedia has definitely enriched and reshaped our daily life and experiences. Particularly, the ever increasing popularity of digital TV demands more innovative multimedia techniques. HDTV will increasingly converge with computer and be the ultimate platform for consuming multimedia information such as video-on-demand system, intelligent authoring, e-Health etc. In order to make this happen, many issues in multimedia computing, production, management and distribution need to be solved. Meanwhile, more value added services should be identified. This application seeks funding to set up an HDTV based multimedia studio to investigate the above issues and to facilitate the development of various techniques and applications for digital TV.

University of Technology, Sydney

LE0668368 Prof AS Mowbray; Prof GW Greenleaf

Title: AustLII's expanding legal research facilities: the innovation engine for development of Commonwealth, common law and Asian legal information infrastructure

2006 : \$650,000

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

University of Technology, Sydney
University of New South Wales
Mallesons and other Law Firms
Counsel's Chambers Ltd and other Bar
Defence Legal
Department of Foreign Affairs and Trade
Administrative Appeals Tribunal
Migration Review Tribunal
Refugee Review Tribunal
Federal Magistrates Court
Supreme Court of Tasmania
National Native Title Tribunal
Griffith Hack and other Patent Attorneys
Takeovers Panel and other Boards and Tribunals
South Australian Industrial Relations Court
CCH Australia Ltd
Attorney-General's Department (Commonwealth)
Australian Law Reform Commission
Consumer, Trader and Tenancy Tribunal of New
Sun Microsystems

Administering Institution: University of Technology, Sydney

Summary:

The Australasian Legal Information Institute (AustLII) is increasing the sophistication and scope of its Australian Internet legal research infrastructure: more interconnections built on more data, for better research. It is leading development of new free access Commonwealth and Asian legal research facilities, and integrating them into the global WorldLII (World Legal Information Institute) platform, in cooperation with international partners. All Australian legal researchers, the Australian community, and national interests, are benefiting. Stage 1 starts the innovations and new databases on AustLII, develops the core of the new international facilities, increases system security and reliability, and satisfies increasing access demands.

2803 : COMPUTER SOFTWARE**Deakin University**

LE0668447 Prof AM Goscinski; Prof DA Abramson; A/Prof Z Tari; A/Prof P Roe

Title: Enterprise Grid Laboratory

2006 : \$320,000

Category: 2803 - COMPUTER SOFTWARE

Partner Organisation(s)

Deakin University
Monash University
RMIT University
Queensland University of Technology

Administering Institution: Deakin University

Summary:

Australia has invested heavily in production high performance computing facilities over recent years, creating significant opportunities for Australian computational scientists. But, the nature of these resources makes them inappropriate for research in experimental computer science, because it is not possible to modify the operating environment, system hardware and software configuration. This proposal seeks to construct a testbed of networked cluster computers to support existing and new research into enterprise grids. The infrastructure will be distributed among four sites so that experiments can be run locally and remotely crossing administrative domains, incurring communication overheads, and heterogeneity.

2903 : MANUFACTURING ENGINEERING**Queensland University of Technology**

LE0668532 Prof JM Bell; Prof Dr J Franzidis; Dr ER Waclawik; Dr R Morrison; Dr DJ Bernhardt; A/Prof A Oloyede

Title: A Focussed Ion Beam-Scanning Electron Microscope for Advanced Analytical and Nanotechnology Research in South East Queensland

2006 : \$680,000

Category: 2903 - MANUFACTURING ENGINEERING

Partner Organisation(s)

Queensland University of Technology
The University of Queensland
Griffith University

Administering Institution: Queensland University of Technology

Summary:

We request a focussed ion beam/scanning electron microscope with a mineral liberation analysis system to enhance and enable a range of research in nanotechnology, biomedical engineering and mineralogical analysis. The system will have the capability to modify surfaces by ion implantation, to mill surfaces and to accurately pattern surfaces at a scale down to 7nm, as well as providing unique capabilities for 3 D compositional and morphological analysis (MLA). It will support sustainable mining industry development and longer term outcomes in biomedical engineering (including implant materials) and nanotechnology (renewable energy, electronic components).

Swinburne University of Technology

LE0668473 Prof SH Masood; Prof M Brandt; Prof PD Hodgson; Dr BF Rolfe; Prof YS Morsi

Title: Direct Metal Deposition Freeform Fabrication Facility for Rapid Tooling and Manufacturing

2006 : \$710,000

Category: 2903 - MANUFACTURING ENGINEERING

Partner Organisation(s)

Swinburne University of Technology
Deakin University
Victorian Centre for Advanced Materials &

Administering Institution: Swinburne University of Technology

Summary:

Direct Metal Deposition (DMD) is a unique laser based layer-by-layer direct fabrication technology for production of 3D metal objects in steel and many commercial alloys of choice directly from CAD data. The DMD machine allows rapid fabrication of complex parts, dies and tools with pre-determined performance. The machine will be one of its kind in Australia. Its uniqueness will be in offering a high level research facility in rapid tooling, fabrication of 3D heterogeneous objects, production of both macro and microstructure to a designed specification and efficient fabrication of dies with conformal cooling channels.

The University of Newcastle

LE0668446 A/Prof SO Moheimani; Prof IR Petersen; Prof GC Goodwin; Prof RH Middleton; Prof M Fu; Dr VA Ougrinovski; A/Prof HR Pota; Dr AJ Fleming; Dr SR Schofield

Title: Nano-positioning facility for nano-scale measurement and manipulation

2006 : \$530,000

Category: 2903 - MANUFACTURING ENGINEERING

Partner Organisation(s)

The University of Newcastle
The University of New South Wales

Administering Institution: The University of Newcastle

Summary:

The proposal is aimed at establishing an experimental nanopositioning research facility to enable Australian researchers to undertake nanotechnology research leading to the development of a new generation of nanopositioning systems. Nanopositioners constitute a key component of many devices used in nanotechnology research including atomic force microscopes, scanning tunneling microscopes and near-field scanning optical microscopes. They are also critical to research in areas such as nanoassembly and nanorobotics, metrology, nanobiology, MEMS/NEMS, and probe-based data storage systems. The facility will give Australian nanotechnology researchers an edge in this high-tech and multidisciplinary field.

2909 : ELECTRICAL AND ELECTRONIC ENGINEERING**University of Wollongong**

LE0668322 A/Prof RA Lewis; Dr RE Vickers; Dr R Mendis; A/Prof D Abbott; Dr SP Mickan; Dr T Rainsford; Dr A Dowd; A/Prof AM Sanagavarapu

Title: Enhancing Australia's Terahertz Infrastructure

2006 : \$147,000

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

Partner Organisation(s)

University of Wollongong
The University of Adelaide
University of Technology, Sydney

Administering Institution: University of Wollongong

Summary:

The terahertz (THz) region, between visible light and microwaves, is the least explored but scientifically richest part of the electromagnetic spectrum. The ARC supports THz at two nodes, Wollongong and Adelaide, with recent substantial DP grants to each. There is also THz expertise and interest at UTS. This initiative aims to remedy two existing deficiencies in the current research infrastructure (1) the lack of a high-resolution source of THz radiation and (2) the lack of a very high power source of THz radiation. These deficiencies will be met by setting up (1) a two-colour mixer and (2) a THz parametric oscillators. Cost savings and operational efficiencies are realised by establishing both simultaneously.

2913 : METALLURGY

Deakin University

LE0668504 Dr MR Barnett; Prof PD Hodgson; Prof X Wang; A/Prof DM Cahill; Dr SR Clarke; Prof M Brandt; Dr Y Durandet

Title: Real-time Observation of Thermal and Mechanical Response at the Nano Level

2006 : \$648,000

Category: 2913 - METALLURGY

Partner Organisation(s)

Deakin University
Swinburne University of Technology
The Flinders University of South Australia
CAST CRC
VCAMM

Administering Institution: Deakin University

Summary:

The aim is to establish a Transmission Electron Microscope (TEM) facility dedicated to determining, in-situ, the nano-scale mechanisms that control the response of materials to stress and temperature. Conventional post mortem analysis is limited in its ability to reveal the nano-scale events that occurred during deformation and heating. In-situ "real-time" observation can provide the missing insight. Such insight is needed for the development of the next generation of materials, particularly "nano" materials based on particles, fibres, whiskers, nano-tubes, thin films and micro-formed parts. The facility will fill an important gap in Australia's ability to generate a fundamental understanding of materials.

2914 : MATERIALS ENGINEERING

Monash University

LE0668517 A/Prof WD Cook; Dr GP Simon; A/Prof GH Edward; Dr JS Forsythe; A/Prof PJ Halley; Prof AK Whittaker; Dr I Blakey; Dr TM Nicholson

Title: Hyphenated techniques in polymer science and engineering

2006 : \$220,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Monash University
The University of Queensland

Administering Institution: Monash University

Summary:

The structure, morphology and mobility of a polymer controls its properties and applications, and the performance and life of the product. The evolution of the structure is dependent on the occurrence of chemical reactions between the components, the miscibility of the components and the effect of processing and the external environment. All of these factors interact with one another. The requested hyphenated equipment will be shared between two research groups who have ongoing collaborations. The equipment will allow the simultaneous measurements of several structural and relaxational parameters simultaneously during photopolymerization and flow which will provide much richer information than can be obtained by sequential measurements.

The University of Newcastle

LE0668469 A/Prof EH Kisi; Dr C Curfs; Dr DP Riley; A/Prof BV King; Prof Dr T Maschmeyer; A/Prof EM Gray; Dr RF Garrett; Mr I Madsen; Dr SA Schmid

Title: **The Rapid Kinetics Research Facility - an Integrated system for rapid kinetic studies of materials using synchrotron radiation**

2006 : \$195,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

The University of Newcastle
The University of Sydney
Griffith University
Australian Synchrotron Research Program (ASRP)
CSIRO - Minerals

Administering Institution: The University of Newcastle

Summary:

This team will construct the world's first dedicated facility for the real-time study of fast irreversible kinetic processes in advanced materials. The integration of a high throughput X-ray detection system and a comprehensive sample environment coupled to existing synchrotron X-ray sources, will allow the continuous recording of diffraction patterns at time intervals as little as 50 milliseconds. It will enable the study of phenomena such as self-propagating high-temperature synthesis, gel crystallisation, the solidification of melts, and rapid gas-solid phase transitions in unparalleled detail. The facility will be accessible to all Australian researchers through the participation of the Australian Synchrotron Research Program.

The University of Sydney

LE0668257 Prof MM Bilek; Dr N Valanoor; Prof DR McKenzie; Prof J O'Connor; Prof MA Green; Prof PA Lay; Dr NJ Ekins-Daukes; A/Prof BV King; A/Prof BW James; Dr GJ Conibeer; A/Prof SH Kable; Dr T Schmidt; Dr K Ostrikov; A/Prof MJ Hoffman; Dr DP Riley; A/Prof M Ferry

Title: **Combinatorial Deposition and Characterisation Facility for New Alloy Thin Film Materials**

2006 : \$1,200,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

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

Administering Institution: The University of Sydney

Summary:

The development of new technologies and industries depends on the availability of advanced functional materials. Recent advances have been made in the science and technology of thin film deposition based on the use of high power pulses. In parallel with these advances new characterisation is available to analyse key properties of the materials deposited. We propose to establish a facility that comprises a pulsed magnetron sputtering system, a pulsed laser deposition system and an ultrafast laser spectroscopy system. This facility will accelerate progress in the discovery and property measurement of new materials.

2915 : BIOMEDICAL ENGINEERING

Queensland University of Technology

LE0668506 Prof MJ Pearcy; Prof RW Crawford; Prof CC Berndt; Dr Q Li; Prof JM Bell

Title: **A Multi-Axis Biomaterials Testing Facility**

2006 : \$150,000

Category: 2915 - BIOMEDICAL ENGINEERING

Partner Organisation(s)

Queensland University of Technology
James Cook University

Administering Institution: Queensland University of Technology

Summary:

Australia's ageing population makes repair of damaged or diseased bones and cartilage a major research priority. Biomechanical testing of materials, implants and tissues forms a critical element of this research. Facilities currently available have limited abilities to simulate the complex load patterns and environments experienced by joints, tissues and implants in the body. The proposed multi-axis testing system will overcome these limitations, enhancing the clinical relevance of test data. The data obtained will contribute to improvements in biomaterials and implant designs. These will enhance the performance and/or longevity of prostheses, ultimately enhancing quality of life and yielding considerable economic benefits.

LE0668502 A/Prof IW Turner; A/Prof R Stonier; Prof AN Pettitt; Prof P Timms; A/Prof B Verma; A/Prof VV Anh; Prof M Mahendran; Prof DL McElwain; A/Prof M Dhanasekar; A/Prof RC Wolff; Prof EP Dawson; Dr CR Cole; Dr JA Young

Title: Queensland Computational Grid Enhancement Project

2006 : \$500,000

Category: 2915 - BIOMEDICAL ENGINEERING

Partner Organisation(s)

Queensland University of Technology
Central Queensland University
Queensland Parallel Supercomputing Foundation

Administering Institution: Queensland University of Technology

Summary:

QUT and CQU researchers develop models for significant industrial, biomedical, data security and environmental applications. The underlying high-end and large-scale simulations must be solved using computational facilities comprising a range of system architectures to guarantee fast and successful computational experimentation. Funding is sought for a modern computational cluster and state-of-the-art supercomputer to meet escalating computational demands and support the latest scientific programming models. The proposed systems will enhance the Queensland computational grid by providing researchers with shared state-wide facilities, ensuring Australian research remains at the forefront of a competitive international market.

University of Technology, Sydney

LE0668541 Prof HT Nguyen; A/Prof NH Lovell; Prof A Craig; Dr PA Watterson; A/Prof AM Sanagavarapu; Dr LA Poole-Warren; Dr S Dokos; A/Prof CD McFarland

Title: Infrastructure for design and testing of implantable and non-invasive intelligent medical devices

2006 : \$260,000

Category: 2915 - BIOMEDICAL ENGINEERING

Partner Organisation(s)

University of Technology, Sydney
The University of New South Wales

Administering Institution: University of Technology, Sydney

Summary:

The Australian market for medical equipment is valued at approximately \$2.5 billion p.a. We are requesting support for infrastructure and equipment to enable the research, development and testing of medical device technologies ranging from non-invasive to implantable devices. Specific equipment is needed to test and develop wireless interfaces that will serve as transcutaneous power and communications links between external devices and implanted devices. Equipment is also needed to test the interface between electronics and tissue - the neural interface. This will yield a new generation of smart medical devices for artificial organs and form the basis of a niche export industry.

2916 : COMPUTER HARDWARE**The University of Queensland**

LE0668445 Prof BA Pailthorpe; Dr RA Gingold; Prof DA Abramson; A/Prof IM Atkinson; Prof S Crozier; Prof MA Ragan; Prof ML Heron; Dr A Khan; Dr PV Ridd; Dr NS Bordes; A/Prof MA Knackstedt; Prof RA Lewis

Title: Data Grid Storage Infrastructure for e-Research

2006 : \$800,000

Category: 2916 - COMPUTER HARDWARE

Partner Organisation(s)

The University of Queensland
The Australian National University
Monash University
James Cook University
OTHER - QPSF Ltd

Administering Institution: The University of Queensland

Summary:

The central goal of this proposal is to provide a long-term, integrated scientific data storage capacity, distributed between Queensland, Victoria and the ACT based on existing high performance storage systems. We will implement an integrated set of distributed digital data archives - a Data Grid - by deploying 200TB of data capacity upgrade at UQ, ANU, Monash University and JCU and supporting the required middleware, thereby leveraging grid practices. This will meet the growing requirements of Australian researchers and facilitate the interchange and dissemination of data across institutions. The initiative builds on existing software developments made overseas and through strategic collaborations between the four universities.

2917 : COMMUNICATIONS TECHNOLOGIES

The University of Sydney

LE0668490 Prof BJ Eggleton; Dr DJ Moss; Dr A Mitchell; Prof SC Fleming; Prof CM de Sterke; Dr JA Bolger; Dr IC Littler; Prof MW Austin; Prof I Cosic

Title: Ultra-high speed optical transmission test-bed for testing next generation photonic devices

2006 : \$207,000

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

Partner Organisation(s)

The University of Sydney
RMIT University
National ICT Australia (NICTA)

Administering Institution: The University of Sydney

Summary:

This project will establish Australia's first facility capable for testing ultra-high speed optical devices at 160 Gigabits per second. The facility will be four times faster than any existing facility in Australia, and will bring Australia on par with a small handful of leading laboratories in the world with this capability, including Bell Laboratories in the US and NTT in Japan. This facility will strengthen linkages between research programs at Sydney University, Melbourne University and RMIT and provide a foundation for their research programs on ultra high speed optical devices for next generation telecommunications networks and defence applications.

2918 : INTERDISCIPLINARY ENGINEERING

The Australian National University

LE0667994 Prof C Jagadish; Prof JS Williams; Prof B Luther-Davies; Prof YS Kivshar; Dr HH Tan; Dr L Fu; Dr Q Gao; Dr DN Neshev; Prof L Faraone; A/Prof JM Dell; A/Prof BD Nener; Dr CA Musca; Dr G Parish; Prof BJ Eggleton; Prof CM de Sterke; Prof RC McPhedran; Dr DJ Moss; Dr C Grillet; A/Prof DM Kane; Dr MJ Withford; A/Prof EM Goldys; A/Prof

JM

Dawes; A/Prof KP Esselle; Prof GM Lu; Prof H Rubinsztein-Dunlop; Dr J Zou; Mr AD Rakic; Dr P Meredith; Dr CJ Vale; Dr S Madden; Dr D Choi; Dr VS Craig; Dr YJ Wong-Leung; Dr M Buda; Prof WZ Krolikowski

Title: National Nanolithography Facility

2006 : \$1,000,000

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

The Australian National University
The University of Western Australia
The University of Sydney
Macquarie University
The University of Queensland

Administering Institution: The Australian National University

Summary:

This project aims to establish a state-of-the-art Nanolithography facility for the Australian Nanotechnology, Photonics and Electronics research community to develop novel nanoscale photonic and electronic devices for defense, communications, computing, energy, environment and health applications. The National Nanolithography Facility will allow the fabrication of nanoscale electronic, photonic and sensor devices. This facility will allow research training in state of the art techniques in the field of nanotechnology. This facility will further enhance the core capabilities in the emerging area of nanoscale science and technology in Australia.

The University of New South Wales

LE0668381 A/Prof CY Kwok; A/Prof F Ladouceur; Prof DN Jamieson; Prof S Prawer; Prof WA Ducker; Prof AS Dzurak; Prof RG Clark; A/Prof G Peng; Prof PN Johnston; A/Prof DG McCulloch; Prof H Rubinsztein-Dunlop; Dr AG White; Dr AV Buryak

Title: Foundational National Nanotechnology Infrastructure

2006 : \$750,000

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

The University of New South Wales

The University of Melbourne

RMIT University

The University of Queensland

Administering Institution: The University of New South Wales

Summary:

Innovations in nanoscale photonics, electronics and biotechnology promise a nanoscale industrial revolution. We seek to develop fundamental nanotechnology infrastructure to be located in Sydney and Melbourne laboratories to maintain our leadership in the foundation sciences of the revolution: silicon and diamond nanotechnology, polymer chemistry, biomedical processes and quantum technology essential for the fabrication and characterisation of nanophotonic devices and nano/micro-electro-mechanical systems.

This additional infrastructure will promote interdisciplinary collaboration in nanotechnology and related projects amongst eminent researchers across four major institutions, building on existing collaborative efforts.

University of Western Sydney

LE0668100 Dr GS Kannangara; Prof R Amal; Dr AS Milev; Prof PA Williams; Dr NH Tran; Dr K Chiang; Dr TR Ireland; Prof MA Wilson

Title: High Resolution Simultaneous DSC/DTA-TGA-FTIR System

2006 : \$200,000

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

University of Western Sydney

The University of New South Wales

The Australian National University

Administering Institution: University of Western Sydney

Summary:

The high resolution DSC/DTA-TGA-FTIR system in this application is the current state-of-the-art for conducting simultaneous thermodynamic, kinetic and spectroscopic analyses of high temperature processes. The aims and significance of this facility lie in it being one of the centrepieces of the partner institutions' ambitions to take Australia to the cutting edge of nanotechnology and related disciplines many of which are areas of national priority. The expected outcomes will help find solutions to fundamental problems of carbon nanotubes/fullerene formation through to applied outcomes, such as nanocomposites and developing deep earth resources enabling to attract and retain excellent researchers in Australia.

3001 : SOIL AND WATER SCIENCES**The University of Newcastle**

LE0668400 Dr RN Drysdale; Dr ID Goodwin; Dr SW Franks; Dr JD Woodhead; Dr J Zhao

Title: A high-throughput stable isotope ratio mass spectrometer for water resource management and climate change studies

2006 : \$100,000

Category: 3001 - SOIL AND WATER SCIENCES

Partner Organisation(s)

The University of Newcastle
The University of Melbourne
The University of Queensland

Administering Institution: The University of Newcastle

Summary:

Better understanding of the climate system is vital to managing Australia's water resources, biodiversity and response to climate change. Increased use of cave speleothems as high-resolution proxy indicators of past climate is not being matched by dedicated instrumentation needed to produce proxy data. Our new mass spectrometer will support low-cost, high-throughput oxygen and carbon isotope analyses, ensuring that Australian speleothem research plays a major national and international role in climate change studies. Applications include the compilation of detailed pre-instrumental rainfall histories from drought-sensitive parts of Australia, and long-term climate variability in the Pacific basin, SE Asia and the North Atlantic.

3002 : CROP AND PASTURE PRODUCTION

The University of Adelaide

LE0668294 Prof SD Tyerman; Dr BN Kaiser; Prof MA Tester; Prof A Bacic

Title: **Isotope Ratio Mass Spectrometry Facility for Nitrogen and Water Analysis in Plants**

2006 : \$110,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Partner Organisation(s)

The University of Adelaide
The University of Melbourne
The Australian Centre For Plant Functional Genomics

Administering Institution: The University of Adelaide

Summary:

Our overall research aim is to improve nitrogen and water use in agronomically important crop species, ultimately directing plants to do more with less external inputs. In plant biology, isotope ratio mass spectrometers (IRMS) coupled to elemental analysers are routinely employed to measure the abundance of stable mass isotopes in organic samples (leaves, roots). A dedicated IRMS facility is now required for the analysis of ¹⁵N and ¹⁸O in plant and water samples. This analytical tool will allow researchers to characterise both nitrogen transport and water resource allocation mechanisms of plants. This analysis is required to complement existing molecular and genetic based projects designed to improve agricultural crop production.

3008 : ENVIRONMENTAL SCIENCES

Southern Cross University

LE0668495 A/Prof BD Eyre; A/Prof LA Sullivan; Dr RT Bush; Prof JK Vanclay; Dr MW Clark

Title: **A Gas Chromatograph-Combustion/Elemental Analyser-Isotope Ratio Mass Spectrometer (GC-c/EA-IRMS) system for Environmental Research**

2006 : \$274,000

Category: 3008 - ENVIRONMENTAL SCIENCES

Partner Organisation(s)

Southern Cross University

Administering Institution: Southern Cross University

Summary:

The proposed Gas Chromatograph-Combustion/Elemental Analyser-Isotope Ratio Mass Spectrometer (GC-c/EA-IRMS) system will allow researchers to analyse the carbon, nitrogen and sulfur stable isotope ratios of bulk samples, but more importantly also the carbon and nitrogen stable isotope ratios of specific compounds. It will be the only GC-c/EA-IRMS system in Australia dedicated to mostly environmental work. The use of GC-c-IRMS techniques in environmental studies is only just beginning to be explored and will allow ground-breaking research to be undertaken resulting in advances in a variety of environmental fields. As such, this system will significantly enhance many core-research programs at Southern Cross University.

The Australian National University

LE0668417 Dr WJ Foley; Prof M Westoby

Title: **New-Generation Near Infrared Spectrometer for Ecological Research**

2006 : \$108,667

Category: 3008 - ENVIRONMENTAL SCIENCES

Partner Organisation(s)

The Australian National University
Macquarie University

Administering Institution: The Australian National University

Summary:

Measuring the chemical composition of plant and animal tissues is an important part of many ecological investigations but oftentimes

the methods for doing so are too slow, expensive or difficult to be useful. Near infrared spectroscopy is an analytical method that solves these problems and allows large numbers of samples to be analysed quickly, cheaply and for multiple constituents simultaneously. The value of NIRS in ecological studies has already been demonstrated but the old generation instruments that have been used to date are failing. New technology will allow analyses made today to be used as the basis of future analyses, which saves time and resources for all ecologists.

3203 : MEDICAL BIOCHEMISTRY AND CLINICAL

The University of New South Wales

LE0668534 A/Prof M Guilhaus; Dr MJ Raftery; Prof CL Geczy; A/Prof R Cavicchioli; Prof R Stocker; Prof MR Wilkins; Prof DE James; Prof MS Baker; Prof RI Christopherson; Prof CG Dos Remedios; Adj/Prof R Davey; Dr EJ Harry

Title: **High resolution bioanalytical Fourier transform mass spectrometer combined with liquid**

2006 : \$770,000

Category: 3203 - MEDICAL BIOCHEMISTRY AND CLINICAL CHEMISTRY

Partner Organisation(s)

The University of New South Wales
Macquarie University
The University of Sydney
University of Technology, Sydney
The Garvan Institute of Medical Research

Administering Institution: The University of New South Wales

Summary:

The project aims to enable life sciences / medical research by enhancing high performance mass spectrometry (MS). Rapidly growing biomedical research involving protein identification/characterisation depends heavily on advances in mass spectrometry and associated separation methods. The outcomes will be to establish a powerful high resolution Fourier transform MS for ultimate sensitivity and selectivity to allow demanding experiments which cannot be undertaken with existing equipment. The new equipment will complement existing infrastructure and significantly extend the competitiveness and amount of research than can be supported by MS

3205 : PHARMACOLOGY AND PHARMACEUTICAL

Monash University

LE0668493 Prof PJ Stewart; Prof J Soria; Dr DR Honnery; A/Prof H Chan; Dr BR Thompson; Dr IC Larson; Dr PM Young

Title: **Characterising particulate laden flow in the lung airways: from drug delivery to primary**

2006 : \$230,000

Category: 3205 - PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Partner Organisation(s)

Monash University
The University of Sydney

Administering Institution: Monash University

Summary:

The objective is to establish a joint facility between Monash University and the University of Sydney to determine flow and particle size characteristics of micronised and nano-sized particles in simulated lung airways. The proposed facilities consists of a 3D Tomographic Imaging System, with its unprecedented resolution and dynamic measurement capabilities, and state of the art particle sizing and will provide advanced research capabilities including three dimensional imaging, measurement of flow, and sizing of particles under different breathing patterns in an in-vitro respiratory tract airway environment for drug delivery, clinical and anthropogenic particle transport applications.

3207 : NEUROSCIENCES**The University of Melbourne**

LE0668266 Prof JB Furness; Dr JA Donald; Dr IM Coupar; A/Prof TJ Lithgow; Dr GR Hime; Dr HM Young; Dr CR Anderson; Dr HR Irving; A/Prof PM Whittington; Dr EL Fletcher

Title: High Resolution Cellular and Molecular Imaging System

2006 : \$264,000

Category: 3207 - NEUROSCIENCES

Partner Organisation(s)

The University of Melbourne
Deakin University
Monash University

Administering Institution: The University of Melbourne

Summary:

Advanced imaging systems provide high resolution, 3-D images of the location of molecules in cells. Recent advances in imaging technology, genetics and molecular biology have dramatically increased the capabilities and impact of imaging systems. Our research requires a system capable of performing advanced imaging functions including the ability to distinguish between fluorescent molecules with only small differences in their spectral characteristics, simultaneously image while ablating or exciting specific cells, and of detecting protein-protein interactions in cells. This system will enable us to continue to generate research of the highest international quality in neuroscience and cell biology.

The University of Queensland

LE0668246 Dr LJ Richards; Dr GJ Goodhill; Prof PF Bartlett; Prof PA Koopman; Prof BJ Wainwright; Prof MT Smith; Prof A Mackay-Sim; Prof T Kilpatrick

Title: Advanced Cell Labelling and Imaging Facility

2006 : \$400,000

Category: 3207 - NEUROSCIENCES

Partner Organisation(s)

The University of Queensland
Griffith University
The University of Melbourne

Administering Institution: The University of Queensland

Summary:

The integrated facility, the first of its kind in Australia, will enable users to image living model organisms with ultrasound technology to perform precise injections of tracers, cell trackers and plasmids for genetic manipulations. The ultrasound technology will be used to image organs in living embryos in utero, in postnatal and in adult animals while injections are performed, as well as to perform volumetric structural analyses in situ. The facility will couple this technology with electroporation to perform genetic manipulation and time-lapse confocal microscopy to observe both cellular migration and the movement of chemotactically guided cells and processes in both living and fixed slices and whole organs.

3602 : POLICY AND ADMINISTRATION**Swinburne University of Technology**

LE0668334 Prof J Thomas; Prof GJ Williams; A/Prof RE Tiffen; Dr PA Strangio; Prof B Costar; A/Prof JD Spoehr

Title: Australian Policy Online Development Project

2006 : \$158,844

Category: 3602 - POLICY AND ADMINISTRATION

Partner Organisation(s)

Swinburne University of Technology
The University of New South Wales
The University of Sydney
Monash University
The University of Adelaide
National Library of Australia

Administering Institution: Swinburne University of Technology

Summary:

This project will extend the depth and breadth of Australian Policy Online, a gateway to research outputs from over 120 research centres, institutes and other research organisations, further increasing its value to site users. The range of research material will be extended to all policy-related material generated by the partner universities; a new section will provide details of current research projects and opportunities; APO's coverage of foreign policy, defence and developments in Southeast Asia will be broadened significantly; a pilot project will link APO with a new South Australian state-based counterpart; and APO's Briefings series will be expanded, enhancing its role as an innovative print outlet for research findings.

3801 : PSYCHOLOGY

Macquarie University

LE0668421 Prof S Crain; Prof M Coltheart; Prof PT Michie; Prof DP Crewther; Dr K Pammer; Dr BW Johnson; A/Prof JB

Title: **A MEG-based cognitive neuroscience laboratory.**

2006 : \$650,000

Category: 3801 - PSYCHOLOGY

Partner Organisation(s)

Macquarie University
The University of Newcastle
Swinburne University of Technology
The Australian National University
The University of Melbourne
University of Auckland

Administering Institution: Macquarie University

Summary:

The project is to develop a magnetoencephalography (MEG) laboratory, including a 160 channel whole head MEG facility, housed at Macquarie University (MACCS). The project is a collaboration with the Kanazawa Institute of Technology, and five partner organizations in Australia and New Zealand. The MEG laboratory will integrate training and research with MEG and on-going and original research in EEG and eye-movement recording, using auditory and/or visual stimulus presentation. The MEG-based lab will position Australia as a world leader in several areas of cognitive neuroscience, including the study of cognitive processing in children, and in several language disorders.

4101 : PERFORMING ARTS

The University of Western Australia

LE0668458 Em/Prof DE Tunley; Prof MJ Kartomi; Dr V Rogers; Dr TN Burrows; Ms RF Holmes

Title: **Sound Footings: creating a web-based research infrastructure of major music archives**

2006 : \$175,000

Category: 4101 - PERFORMING ARTS

Partner Organisation(s)

The University of Western Australia
Monash University
National Library of Australia

Administering Institution: The University of Western Australia

Summary:

Sound Footings will foster Australian music research through the cataloguing, preservation, digitizing and digital archiving of two major and unique music collections. A collaborative project between The University of Western Australia, Monash University and the National Library, Sound Footings will create a web-based national infrastructure comprising catalogues of UWA's Eileen Joyce Collection and Monash's Archive of Australian and Asian Music, with international online access to digitally-transferred sound recordings and print documents. The project will open up significant new research resources in areas as diverse as twentieth-century piano performance, Asian studies, national and regional ethnomusicology, and Australian immigration.

University of Western Sydney

LE0668448 A/Prof CJ Stevens; Dr E Schubert; Dr DA Cabrera; Prof JA Wolfe; Dr JR Smith; Dr D Sen; Prof RT Dean; Prof DK Burnham; Dr S Malloch; Dr GC Paine; Dr FA Bailes; Prof CT Best

Title: See Hear! Multimodal Recording and Analysis Facility

2006 : \$150,000

Category: 4101 - PERFORMING ARTS

Partner Organisation(s)

University of Western Sydney
The University of New South Wales
The University of Sydney
University of Canberra
Australian Choreographic Centre

Administering Institution: University of Western Sydney

Summary:

The Multimodal Recording and Analysis Facility comprises new interfaces for analysis of complex visual and auditory scenes - faces, biological motion, music, speech. The system will record and integrate data from two or more modalities and enhance the accuracy of tracking in one with input from another. The integrated tools provide a sophisticated and innovative suite of hardware and software that tracks and analyses components of sound recordings, live musical performances, human movement and non-verbal communication such as gesture, infant-infant interaction, parent-infant interaction, and motion of musicians or dancers as they perform or improvise.

4202 : LITERATURE STUDIES**The University of Queensland**

LE0668073 Prof JA Hay; A/Prof RA Fotheringham; A/Prof DJ Carter; Ms KM Kilner; Ms AH Horn; Prof BH Bennett; Prof PR Eggert; Mr JF Arnold; Prof EA Webby; Mr RH Coleman; Prof GR Worby; A/Prof W Ommundsen; Ms DM Bird; Prof DJ Haskell; Dr CM Taylor; Dr P Mead

Title: AustLit - humanities research infrastructure development through knowledge-based dataset building, augmentation of key research elements and ICT developments.

2006 : \$544,000

Category: 4202 - LITERATURE STUDIES

Partner Organisation(s)

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

Administering Institution: The University of Queensland

Summary:

AustLit is national humanities research infrastructure featuring authoritative data on Australian literature and print culture from the late 1800s. Further developments during 2006-2008 will build upon AustLit's successes and deliver a fully mature research facility to the education and library sectors internationally. Content initiatives include the delivery of a comprehensive dataset of literary bio-bibliography; enhanced datasets relating to Indigenous and regional literatures, and publishers of Australian literature. ICT initiatives include the development of a generic middleware platform based on AustLit's data model; expanded interoperation with related resources and greater public availability through Australia-wide library access.

4301 : HISTORICAL STUDIES

The Australian National University

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Title: **The Australian Dictionary of Biography Online and Emerging National Information Systems: Networking Research Capability**

2006 : \$350,000

Category: 4301 - HISTORICAL STUDIES

Partner Organisation(s)

The Australian National University
The University of Melbourne
The University of Sydney
Macquarie University
University of South Australia
Griffith University
Monash University
National Library of Australia
National Museum of Australia
National Archives of Australia

Administering Institution: The Australian National University

Summary:

The Australian Dictionary of Biography Online and Emerging National Information Systems Project will extend the capacity of the ADB Online to act as a key agent in the development of a national open-information network for research in the humanities and social sciences. In association with national cultural institutions, the project will create sustainable links between information systems and will pioneer ground-breaking research capabilities. Setting new standards for accessibility and usability, it will be a major driver in the development of a comprehensive network of digitised resources. It will provide advanced cultural informatics able to be adapted to accommodate technological innovations and the changing needs of scholarship.